PAPER TRADE JOURNAL

Vol. XCVII OCTOBER 5, 1933 No. 14

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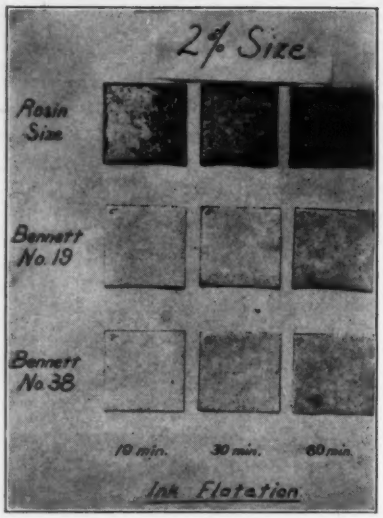

The above photograph shows the ink penetration on samples of sulphite paper that were sized with equal amounts, on the dry basis, of rosin size and Bennett Rosin-Wax Sizes. Samples 1" square were taken from carefully prepared test sheets of the same basis weight, made from the same stock and under identical conditions, so that the only variation was in the kind of size used.

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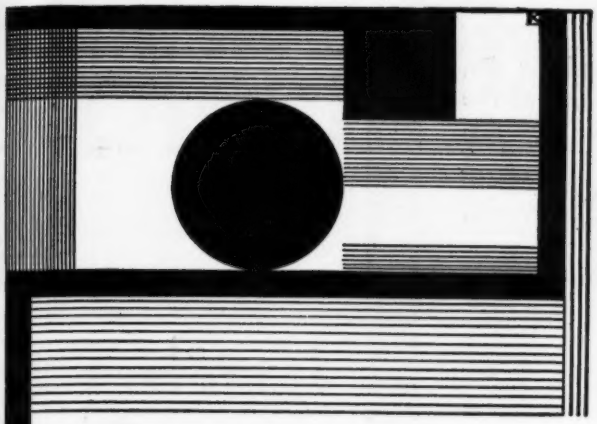

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Developed by Dr. Julius Bekk of the Ullstein Printery, Berlin, Germany and manufactured by the Fuess Works.

The advantage of accurately gauging the smoothness of printing papers cannot be overestimated. For the first time, this important paper quality may be numerically determined by means of the Bekk Smoothness and Porosity Tester — an apparatus revolutionary in its scope as it definitely supersedes the haphazard and rule-by-thumb gauging hitherto in vogue. A highly sensitive instrument, it effects a simple and quick determination of this factor and may be used for establishing degree of porosity as well.

The importance of determining the smoothness factor of paper is stressed in the "Fifth Report of the Study of News Print and News Ink." We quote from that source.

SMOOTHNESS—This is a most important property from the printing standpoint but until recently, no method of measuring this property has been available. Results of tests made with the Bekk Smoothness Tester on many samples of newsprint are reported in this bulletin. They show variations in the surface of commercial newsprint ranging from 23 seconds to 160 seconds, the longer time indicating the smoother paper. The average of over 500 samples was 43 seconds on the wire side and 51 seconds on the felt side. Such checks on these tests as we were able to make with the printed sheets indicate that papers giving the higher tests with the Bekk instrument gave the better printing. Now that a method of measuring smoothness of paper is available, newsprint manufacturers will be enabled to measure the smoothness of their product in numerical terms. It is hoped that it may be possible in the future to establish a smoothness range for newsprint within which the best printing may be expected. It has been established that there is a relationship between the smoothness of newsprint and the rate of ink absorption as measured by the oil absorption test. . . as the smoothness increases the rate of all absorption decreases. There is therefore an upper limit in smoothness which should not be exceeded.

* Technical Bulletin No. 18, U.S.G.P.O.

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PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. XCVII, No. 14 Thursday, October 5, 1933

Technical Association Meets at Appleton

Eighteenth Fall Meeting Is Largely Attended by Representative Technical Men and Helps Celebrate the Seventy-fifth Anniversary of the Establishment of the Paper Industry in the State of Wisconsin—Special Programs Are Prepared by the Institute of Paper Chemistry and the Forest Products Laboratory

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, WIS., October 2, 1933.—The eighteenth annual fall meeting of the Technical Association of the Pulp and Paper Industry was held in Appleton last week and fittingly aided in celebrating the seventy-fifth anniversary of the establishment of the paper industry in the State of Winconsin. About 350 attended as well as a large number of non-member representatives of local industries.

Articles of Organization Amended

President Abrams read a resolution which was regularly approved, recommending that Article XII of the Articles of Organization be amended to read "A testing method, a specification or a recommended practice may receive approval as a tentative standard by the affirmative vote of *three-quarters* of the members of the committee under which it naturally falls," etc. (Remainder the same as at present.)

Institute of Paper Chemistry Program

One of the main reasons for selecting Appleton as a meeting place was to enable many Technical Association members to inspect the new graduate school of the industry, the Institute of Paper Chemistry. To further illustrate the Institute's purposes the entire first session was devoted to the consideration of papers based on the doctor's theses of this year's graduates and papers dealing with subjects receiving the attention of members of the Institution's faculty. President Allen Abrams and H. F. Lewis presided as chairmen.

R. L. Davis described "An Alkaline Process for Obtaining High Yields of Pulp from Aspen Wood." This was a process of soda cooking, consisting of an alkaline digestion with a low percentage and concentration of alkali followed by a first stage chlorination, an alkaline wash, and a final hypochlorite bleach. Very favorable results were obtained.

E. H. Voigtman reported "A Study of the Factors Influencing the Chlorination of Mitscherlish Sulphite Pulp." It was found that high pulp concentrations during chlorination result in having a pulp with lower cuprammonium viscosity and alpha cellulose content and strength, higher bleachability and lignin content. The higher the temperature the lower the bleachability and lower the viscosity. Chlorine in excess of 50 per cent of the demand produced degraded cellulose.

H. W. Bialkowsky made "A Contribution to the Knowledge of Rosin Sizing." The nature of pulp fibers appears to be an important factor in rosin sizing. Rag stocks and alpha fibre are more difficult to size than bleached sulphite pulp, which in turn, is more difficult than unbleached sulphite. The higher the cellulose purity the more difficult it is to size.

E. R. Laughlin made some "Observations Relative to the Physical and Chemical Changes Taking Place in Cooking New White Rags." Pressures in excess of 150 pounds degrade rags physically and chemically. Time of cooking is not of great importance if the pressure is 100 pounds or less and the sodium hydroxide concentration does not exceed 3 per cent based on the weight of rags.

H. F. Lewis and B. L. Browning presented "A Critical Study of the Methods for the Determination of Alpha Cellulose." Dr. Lewis as chairman of the TAPPI Fundamental Research Committee was requested to make this study so that the industry may have the best testing method possible.

B. W. Rowland read a paper on "Colloidal Control in Starch Sizing. In it he stressed the need for slow cooking in starch preparation and close microscopical inspection of the product. In the use of starch it was recommended that it be added after the stock is well beaten and ready for delivery to the paper machine. When the alum is added after the starch it precipitates the starch on the fibres and coats the latter with an alumina starch mixture.

H. F. Lewis and B. L. Browning reported for the Fundamental Research Committee its findings relative to "The Methods for the Determination of Alpha Cellulose." In the United States three methods are used, namely, those sponsored by the Forest Products Laboratory, the Cellulose Division of the American Chemical Society and the Bureau of Standards. Recommendations were made concerning sample preparation, method of filtering solutions and method of dilution. The TAPPI Pulp Testing Committee procedure with slight modification was suggested.

Robert E. Wilson Speaks

The special feature of the first luncheon was an address by Robert E. Wilson, vice-president in charge of research

of the Standard Oil Company of Indiana whose subject was "Research Attitude in Corporate Organizations." Dr. Wilson stressed the value of stimulating a research point of view throughout the organization and advised research men to consider the raw material and distribution end as well as the manufacturing processes.

Mill Visits and Smoker

Because of rain on Tuesday the golf tournament was postponed and visits were arranged to the Neenah, Bergstrom and Gilbert Paper Companies' mills as well as to the shops of the Valley Iron Works, Appleton Wire Works, Appleton Machine Company and to the Institute of Paper Chemistry.

The evening program was featured by a smoker and entertainment at the North Shore Golf Club in Neenah.

Forest Products Laboratory Program

The program of Wednesday, September 27 was devoted to the discussion of a number of papers presented by members of the staff of the Forest Products Laboratory, Madison, Wisconsin. C. E. Curran of the Forest Products Laboratory presided. C. P. Winslow director of the Laboratory, introduced the program.

W. A. Chilson and P. K. Baird outlined the work under way in the "Forest Products Laboratory Research on Paper Machine Variables." This work will consist of (1) the identification of the independent and dependent variables of the paper machine; (2) the development of methods and equipment for controlling all variables and for increasing the flexibility of the equipment; (3) studies of the effects of the variables on sheet properties (all independent variables except the one being studied to be maintained constant and dependent variables to be studied in groups) and (4) the design and manufacture of papers and paper boards of definite physical and chemical characteristics with engineering precision to meet the requirements of use.

W. A. Chilson, F. A. Simmonds, P. K. Baird, and C. E. Curran discussed, "The Influence of Stock Temperature and pH Concentration on the Sheet Properties of Kraft Paper Sized with a Special Starch Sizing." The corn starch size used increased the bursting, tearing and tensile strengths of kraft paper when the starch was added to the stuff entering the chest at a pH of 4.4 to 5.5. At pH 6.5 only the bursting strength was increased. The addition of the starch had no effect on the porosity or water resistance of the paper.

C. E. Hrubesky, P. S. Billington and P. K. Baird reported on "The Comparative Serviceability and Processing

GROUP PICTURE TAKEN AT THE EIGHTEENTH FALL MEETING OF THE TECHNICAL ASSOCIATION

Effects of Oval Cast Iron and Circular Steel Rods in the Rod Mill." The oval rods appear to exert a pounding action rather than a rubbing or rolling action as in the case of the circular rods. The physical properties of the stock developed more rapidly and reached a higher maximum at each consistency when circular rods are used. Less power is consumed to obtain the same result with circular rods.

C. O. Seborg, R. H. Doughty and P. K. Baird discussed "The Effect of Relative Humidity on the Moisture Content and Bursting Strength of Container Boards." The bursting strength varied with the moisture content, reaching a maximum at about 6 per cent. The boards exhibited a hysterisis effect in moisture content. The moisture content at a given relative humidity depends on whether the equilibrium was reached by absorption or desorption of moisture.

F. A. Simmonds reported on studies relating to "The Capillary Rise of Water in Fibrous Sheets and Possible Applications. There is a definite relation between the time and the height of capillary rise of water in strips of certain types of pulp and paper sheets. Water is unsuitable for testing calendered and sized papers since the sorption is too slow. The results of these tests can be used to indicate the uniformity of the pores and the sheet structure.

R. H. Doughty and P. K. Baird outlined "Some Factors Affecting the Interweb Adherence of Single Plies used in Laminated Sheets." The adherence within the web (interaweb strength) is independent of the pressure under which the web is pressed. The interweb strength of a ply decreases with increase in the pressing pressure on the webs, and increases with increase in the pressure under which the webs are joined.

E. R. Schafer and Matti Santaholma discussed the "Chemical Properties of Screen Fractions of Black Gum and Slash Pine Groundwood Pulps." It was found that the lignin content and one per cent caustic soda solubility is higher in finer fractions than in the coarser.

C. E. Hrubesky and G. H. Chidester reported on tests dealing with "Penetration of Western Hemlock Chips by Calcium Bisulphite Liquor." Wood heated in liquid which was gradually raised to 110 degrees in two hours was found to be unburned and produced satisfactory pulp.

J. S. Martin, M. W. Bray and C. E. Curran reported on the "Chemistry of the Alkaline Wood Pulp Process—IV. Is There a Critical Temperature for the Sulphate Process?" There appears to be no critical point under ordinary cooking conditions but there would be at abnormally high temperatures.

Dr. Sherrard of the Laboratory gave a brief report of

THE PULP AND PAPER INDUSTRY, NORTH SHORE COUNTRY CLUB, NEENAH, WIS., SEPTEMBER 27

the lignin symposium at the recent American Chemical Society meeting in Chicago.

A simple and impressive ceremony was performed at the Kimberly Memorial Library at noon when a painting of J. A. Kimberly was unveiled.

Sports Program

Wednesday afternoon was devoted to golf, trap shooting, horse-shoe pitching and other contests following which a number of elaborate prizes were given to winners who included E. C. Jacobi, Dr. Tauslow, and E. S. Bissell for trap shooting; Herb. Heilig and P. D. Miller for horseshoe pitching; A. B. Hausen, R. H. Miller, O. L. LaRoux, J. S. Martin, E. Hilford, G. H. McGregor, A. G. Wakeman, C. E. Curran, M. McMahon, F. D. Turner, C. L. Bachender, W. E. Buchanen, Bud Mueller, G. Hermann and Dave Murchison for golf.

Banquet and Medal Presentation

Nearly 400 attended the main banquet. President Abrams introduced Dr. Henry M. Wriston, president of Lawrence College as toastmaster who called on the past presidents R. S. Hatch, G. E. Williamson and M. A. Krimmel for brief remarks.

Otto Kress was then called on to make the TAPPI medal presentation to Ernst Mahler, vice president of Kimberly-Clark Corporation. Dr. Kress stated that Mr. Mahler is the highest ideal of a technical man, one of the founders of TAPPI, a graduate of Darmstadt, introducer into the United States of the bleached groundwood book paper, cellucotton, Voith stock inlet screen and screw press, developer of the Niagara beater, promoter of technical control and higher education of technical men for the industry.

In accepting the medal Mr. Mahler very modestly disclaimed his right to receive the honor conferred on him and expressed his appreciation thereof. He indicated that the NRA program offers great opportunities for the technical man. With unfair competition coming to an end and the requirement of companies to sell at prices above cost large rewards will come to concerns that are fostering intelligent research. In closing Mr. Mahler advised technical men to keep a technical point of view irrespective of the position they may in the future occupy as executives and always extend a helping hand to technical men in their organizations.

F. J. Sensenbrenner, president of the Kimberly-Clark Corporation was then introduced as the principal speaker. Mr. Sensenbrenner talked on the future of the paper industry under the National Recovery Administration.

Program of Thursday, September 28

A general program of papers was presented, C. C. Heritage presided. R. M. Cobb of the Lowe Paper Company, D. S. Chamberlin and B. A. Dombrow of the National Oil Products Company, discussed "Emulsified Wax Sizes." There is a place for wax sizing in paper technology. Among the advantages cited are improved sheet finish and flexibility, greatly improved quality feel, improved printing quality due, in part to finish and in part to ink resistance of paraffin wax and a more water resistant sheet.

J. D. Miller, chairman of the TAPPI Materials of Construction Committee, read "A Report on Tests of Regular and Stabilized 18-8 Alloy Welds in Sulphite Liquor." This study was made by the Committee who found that the regular low carbon and titanium stabilizes low carbon 18-8 alloys and can be used in the welded condition without suffering intergranular corrosion by sulphite liquor. High carbon 18-8 alloys should always be heat treated after welding and before being used in sulphite service.

L. Thomassen and D. W. McCready of the University of Michigan reported on "X-Ray Investigations of the Penetration of Electrolytes into Wood." Penetration was found to be more rapid in summer wood than in spring wood. The penetration of caustic soda solutions into wood was greater than that of water and this penetration increases with the temperatures.

M. A. Youtz and B. E. Lauer of the Northern Paper Mills, presented a method for "The Commercial Evaluation of Pulp Cord Wood."

W. R. Willets of the Titanium Pigment Company submitted a paper on "The Opacifying of Paper by Means of Titanium Pigments." Particular attention is drawn to the small particle size and inertness of titanium oxide.

Two papers were presented dealing with work done at Madison for TAPPI in comparing sheet machines. F. A. Simmonds and R. H. Doughty discussed the "Application of Statistical Methods to Testing for Pulp Evaluation." R. H. Doughty and C. E. Curran reported on "The Comparison of Sheet Machines for Pulp Comparison."

A group of papers on pulp color were presented as follows: L. C. Lewis of the Mead Corporation discussed, "The Usefulness of Pulp Color Measurements in Paper Making." R. S. Hatch and H. A. Hauff described results from using The Razek-Mulder Analyzer and E. S. Bissell described the new Bausch and Lomb color comparitor.

M. A. Heath, M. W. Bray and C. E. Curran described the "Analysis of Alkaline Black Liquors of Varying Sulphidity by Ammonia Distillation Methods."

The afternoon was devoted to golf and mill visits.

An interesting program was prepared for the ladies present and included golf and bridge tournaments at the Butte des Morts Golf Club; a visit to the Institute of Paper Chemistry and to Oshkosh to see a style show.

The success of the meeting was largely due to the excellent work of the local committee under the chairmanship of Otto Kress. Those on the committee included: R. J. Le Roux, W. H. Ryan, C. E. Sacker, Mrs. R. J. Le Roux, T. E. Xistris, S. D. Wells, P. A. Paulson, G. H. McGregor, A. F. Kletzein, R. J. Watts and their coworkers.

Those in Attendance

Those present included the following: Allen Abrams, Marathon Paper Mills; Mrs. Allen Abrams, Wausau, Wis.; L. C. Anderson, Ontario Paper Co.; Mrs. L. C. Anderson, St. Catherines, Ont.; Oscar E. Anderson, Marinette and Menominee Paper Co.; Sam I. Anderson, Hooker Electrochemical Co.; Harry Andrews, Congoleum-Nairn Inc.; H. M. Annis, Allied Paper Mills; Mrs. H. M. Annis, Kalamazoo, Mich.; S. I. Aronovsky, Northwest Paper Co.; Ralph Atkins, Institute Paper Chemistry.

C. A. Babcock, Wisconsin River Paper Co.; C. L. Bachelder, Paper Makers Chemical Corp.; C. M. Baker, American Paper and Pulp Association; H. T. Baker, Dayton, Ohio; P. K. Baird, Forest Products Laboratory; Robert W. Ball, Krebs Pigment and Color Corp.; M. D. Bardeen, Lee Paper Company; R. L. Barton, Michigan Paper Co.; E. F. Bearce, Chillicothe Paper Co.; Mrs. E. F. Bearce, Chillicothe, Ohio; E. N. Bechard, Eastwood Neally Co.; Bernard Benson, Williams Gray Co.; D. W. Bergstrom, Bergstrom Paper Co.; Nathan Bergstrom, Bergstrom Paper Co.; E. E. Berry, Beloit Iron Works; Harold Bialkowsky, Gilbert Paper Co.; O. T. Birkeness, Wallace & Tiernan Co.; E. S. Bissell, Bausch and Lomb Optical Co.; A. L. M. Bixler, Institute Paper Chemistry; Miss Selma Blair, TAPPI; H. G. Boon, Kimberly-Clark Corp., Neenah, Wis.; L. M. Booth, Booth Chemical Co.; Paul Boronow, Valley Iron Works Co.; F. W. Boyce, Wausaw Paper Co.; C. S. Boyd, Appleton Coated Paper Co.; G. J.

(Continued on page 49)

October Announcement

"The things which are seen are temporal but the things which are not seen are eternal."

Good machines, good beaters, are "things seen" and you are proud to own them, but the standing and reputation of your mill are "things not seen." If your beaters produce good paper your mill soon has a reputation for making good paper. A reputation for good or for bad endures. It is almost "eternal."

"Your paper is made in your beaters." They must be modern beaters. During this year we have re-built (modernized) a good many old style beaters. During the past few years we have modernized a very great many. If you cannot put in new beaters right now you should have us modernize your old beaters. Prices have advanced but the prospect is for much higher prices later on.

General business has slowed down a little and now is the time to build up your beaters and get ready for the steady upward grind that is ahead.

Have faith. Put in good equipment. Make good paper. Bring to your mill an *eternally* good reputation.

— Dilts —

MACHINE WORKS Inc. FULTON, N.Y.

"Your Paper Is Made in Your Beaters"

Hear Code for Paper Distributing Trade

Sharp Protest by Representatives of the Twine and Cordage Industry Being Included Under the Code Sponsored by the National Paper Trade Association Featured Hearing Before Administrator W. W. Pickard at the Raleigh Hotel—Text of the Amended Code

WASHINGTON, D. C., October 4, 1933—A sharp protest by representatives of the twine and cordage industry against being included under a code of fair competition proposed by the National Paper Trade Association featured the public hearing on the code before Deputy Administrator W. W. Pickard at the Raleigh Hotel, last week.

At the last moment apparently it was suggested that the code be applied to the paper and twine distributing industry rather than to the paper distributing industry. The protest was filed by Amos M. Coath, representing the National Twine and Cordage Trade Association. Mr. Coath, whose organization was formed just prior to the hearing, pointed out to the Deputy Administrator that the extensive use of gummed paper and twisted paper instead of twine in doing up parcels had made the paper companies a competitor of the twine and cordage industry rather than an allied field of endeavor.

In presenting the code Sidney L. Wellhouse, president of the National Paper Trade Association, told the Deputy Administrator that the code would cover an industry with a capital investment of $125,000,000 to $150,000,000, employing 20,000 to 25,000 persons and with an annual payroll of from $40,000,000 to $50,000,000. According to L. D. Mahon, of the B. F. Bond Paper Co., Baltimore, who discussed article 4 dealing with maximum hours and minimum wages, the provisions of the code were to increase employment in the industry generally from 15 to 20 per cent, bringing about a return to the 1928-1929 level.

Maximum Week

The code called for a maximum work week of 40 hours for store, office, department, establishment or warehouse employes in any period of 60 days with no more than 48 hours in any one week; 48 hours per week for firemen and janitors, and a 10 per cent tolerance for shipping and receiving employes.

J. S. Barshay, representing the Metropolitan Bag and Paper Jobbers Association, told the Administrator that his organization together with the Cosmopolitan Twine and Paper Association and the Paper Trade Association of New Jersey, had filed a code of their own but that they wished to go on record as in favor of the present code, but asked representation on the code authority.

Jacob H. Corn, representing the two latter named organizations, was gently rebuked by the Deputy Administrator for preferring his request to be allowed to be heard through counsel for the National Paper Trade Association, rather than directly by Mr. Pickard.

"I am very sorry to have erred in this matter," said Mr. Corn, "but I did not know your rules. Mr. Javits was merely my messenger to the throne."

The Deputy Administrator was highly amused. Considerable dispute arose over the proportion of representation allotted to the National Association upon the code authority, but arbitration following a survey of the whole field was agreed upon.

AMENDED CODE OF FAIR COMPETITION FOR THE PAPER DISTRIBUTING TRADE

Article I—Purpose

To effectuate the policy of Title I of the National Industrial Recovery Act there is submitted herein a Code of Fair Competition for the Paper Distributing Trade.

Article II—Definitions

Scope of trade and terminology of Code.—Terms used herein are hereby defined as follows:

"Trade."—The distribution by merchants in the United States of any or all lines of Paper and Paper Products, twine such as is usually distributed by such merchants, with incidental processing of such products usual and ordinary in such trade.

"Member."—A person, firm, or corporation engaged, in whole or in part, in such trade.

"Employee."—Any person performing work or labor in the trade.

"Association."—The National Paper Trade Association.

"Act."—The National Industrial Recovery Act.

"President."—The President of the United States.

"Administrator."—The National Industrial Recovery Administrator appointed under the National Industrial Recovery Act.

Article III—Administration

1. There is hereby created a body to be known as the Executive Authority which is generally charged with the duty of administering this Code under the sanctions and with the approval of the Administrator.

2. The Executive Authority shall consist of the following:

(a) Seven members selected by the Board of Directors of the Association;

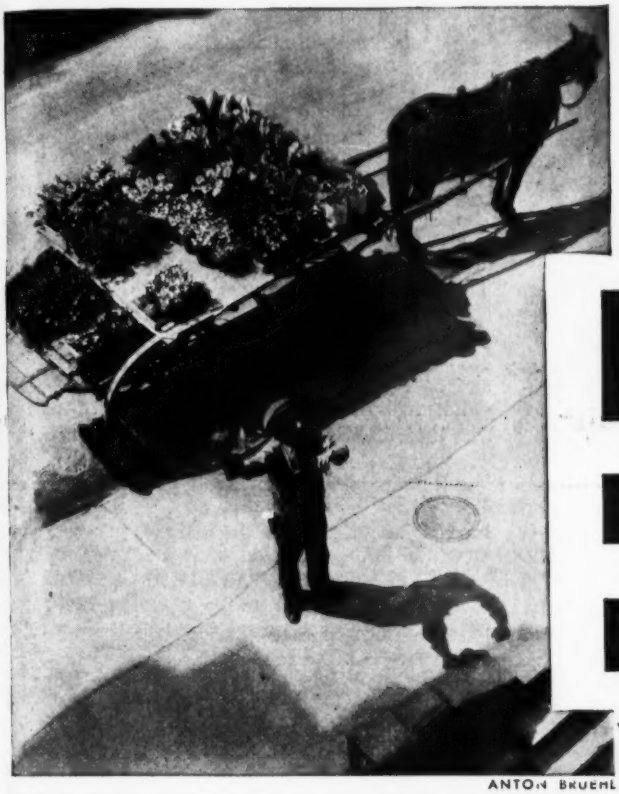
(b) Two members selected by members of the Trade, non-members of the Association, in an equitable way with the approval of the Administrator (or such two members may be selected by the Administrator);

(c) Together with not exceeding three additional advisory members thereof who may be designated by the Administrator; the member or members so designated shall have no vote, but in all other respects shall be members of the said Executive Authority.

The Executive Authority shall serve for the duration of the Act or until new appointments are necessary by reason of death, resignation, or inability to act, and members of the Executive Authority may be removed, with the consent of the Administrator, in the same manner as they are selected.

3. The Executive Authority shall cooperate with the Administrator in making investigations as to the functioning and observance of any of the provisions of this Code, at its own instance or on complaint of any person affected, and report its findings to the Administrator. It may present to the Administrator recommendations based on conditions in the Trade as they may develop from time to time, and may set up further Code provisions or supplementary Codes, subject to the approval of the President, as may appear necessary to insure fair competition in specific lines of merchandise, and to effectuate the policies of the Act. These additional provisions and supplements when approved by the President shall have the same force and effect as any other provisions of this Code.

4. The Executive Authority may from time to time appoint such committees as it shall deem necessary or



ANTON BRUEHL

NO *business* IS SMALL BY CHOICE

The growth of a business is in direct ratio to the service it renders.

Every business, down to the lowliest street vendor, wants to grow.

But the mere desire to grow is not enough. Business leadership comes only to those who merit it.

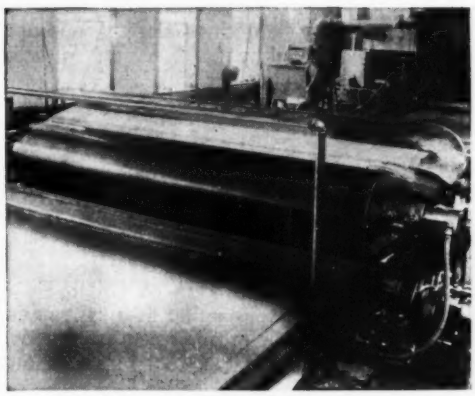
No amount of selling will bring it: no amount of advertising will hold it.

Your soundest justification for confidence in a given product is the position its maker holds in the industry.

The United States Rubber Company has gained its present position as the world's largest manufacturer of mechanical rubber goods through no miracle—that place has been won. And it is *held* with the same policies and the same standards that made *"U. S."* the leader in this field.

We don't mean by this that there are not other good mechanical rubber products. Any leading make will give you excellent value. Any manufacturer can fill your specifications to the letter. Our point is that the United States Rubber Company, with its exceptional facilities and resources, gives you something more, something that cannot be written into a specification. You, too, could benefit by that *extra* service through which *"U. S."* has earned its place.

We believe you will find it worth your while to consider what *"U. S."* can offer you in belting, hose, packing and similar rubber products.



U. S. Rubber Rolls, Rollstone Rolls, etc., are the accepted standard in many leading Paper Mills.

It has become the custom, in many industrial plants, to buy largely on a price basis. Unwilling to look into the future, buyers insisted upon immediate savings. Today, with the growing demand ahead, the actual worth of an article again measures its final cost.

"U. S." offers you a most complete line of rubber goods embracing every type of belting, hose, packing, moulded goods, electric wire and tape, rubber rolls, rubber tank-linings, etc., products which have earned a reputation, throughout industry, for *that extra service.*

United States Rubber Company

1790 BROADWAY NEW YORK CITY

STOCKS IN ALL INDUSTRIAL CENTERS

"U. S." RUBBER PRODUCTS GIVE THAT EXTRA SERVICE

proper, with a view to geographical requirements, in order to effectuate the purposes of this Code, and the Executive Authority shall make uniform rules and regulations for the organization and functioning of such committees, which shall be known as Regional Committees, and may delegate to any such Regional Committee or Regional Committees, generally or in particular instances, such of the powers and duties of the Executive Authority under the Code as such Executive Authority shall deem necessary or proper in order to effectuate such purposes. Any member of such committee may be a member of the Executive Authority, or a member of the trade, or an officer or director of a member of the trade, or an officer or director of a member of the Association, or a person not having any official connection with any member of the trade or with the Association, as the Executive Authority shall deem proper.

5. Where the laws of any State permit the adoption and enforcement of Codes of Fair Competition by members of a trade or industry operating in such State, and such Codes shall have been adopted and approved by the constituted authority of such State, the Executive Authority shall, with the approval of the President, approve such Code insofar as it is not contrary to the provisions of this Code, and shall, with the approval of the President, designate it as supplementary to this Code insofar as it affects the Trade in the said State.

6. The expense of maintaining the Executive Authority and of administering this Code shall be borne by the National Paper Trade Association and the members of the Trade in such proportions and amounts and in such manner as may be determined by the Executive Authority. Failure to pay any assessment levied hereunder for thirty days after notice shall constitute a violation of the Code.

Article IV—Hours of Labor—Rates of Pay

1. In accordance with the provisions mandatory under Title I, Section 7 of the Act:

(a) All employees in this Trade shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection.

(b) No employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting a labor organization of his own choosing.

(c) Employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President.

2. On and after the effective date of this Code, employers in the Trade shall not:

(a) Employ any person under 16 years of age, except that persons between 14 and 16 may be employed (but not in manufacturing or mechanical departments) not to exceed three hours per day, and those hours between 7 A. M. and 7 P. M., in such work as will not interfere with hours of day school. Provided, however, that where a State law provides a higher minimum age, no person below the age specified by such State law shall be employed within that State.

(b) Work any employee in any store, office, department, establishment, or warehouse, or in any other place or manner, more than an average of 40 hours per week in any period of 60 days, and in no event more than 48 hours for any one week, and 8 hours in any one day, except the following:

(1) Employees in a managerial, supervisory, or executive capacity now receiving $35.00 or more per week, and outside salesmen.

(2) Watchmen and employees engaged in emergency repair work.

(3) Firemen and janitors who may be employed a maximum of 48 hours per week and a maximum of 8 hours in any one day.

(4) Employees engaged in shipping and receiving services, and elevator operators who may be employed a maximum of 40 hours per week and a maximum of 8 hours in any one day, with a tolerance of 10%; and employees engaged in outside trucking service, who may be employed a maximum of 48 hours per week.

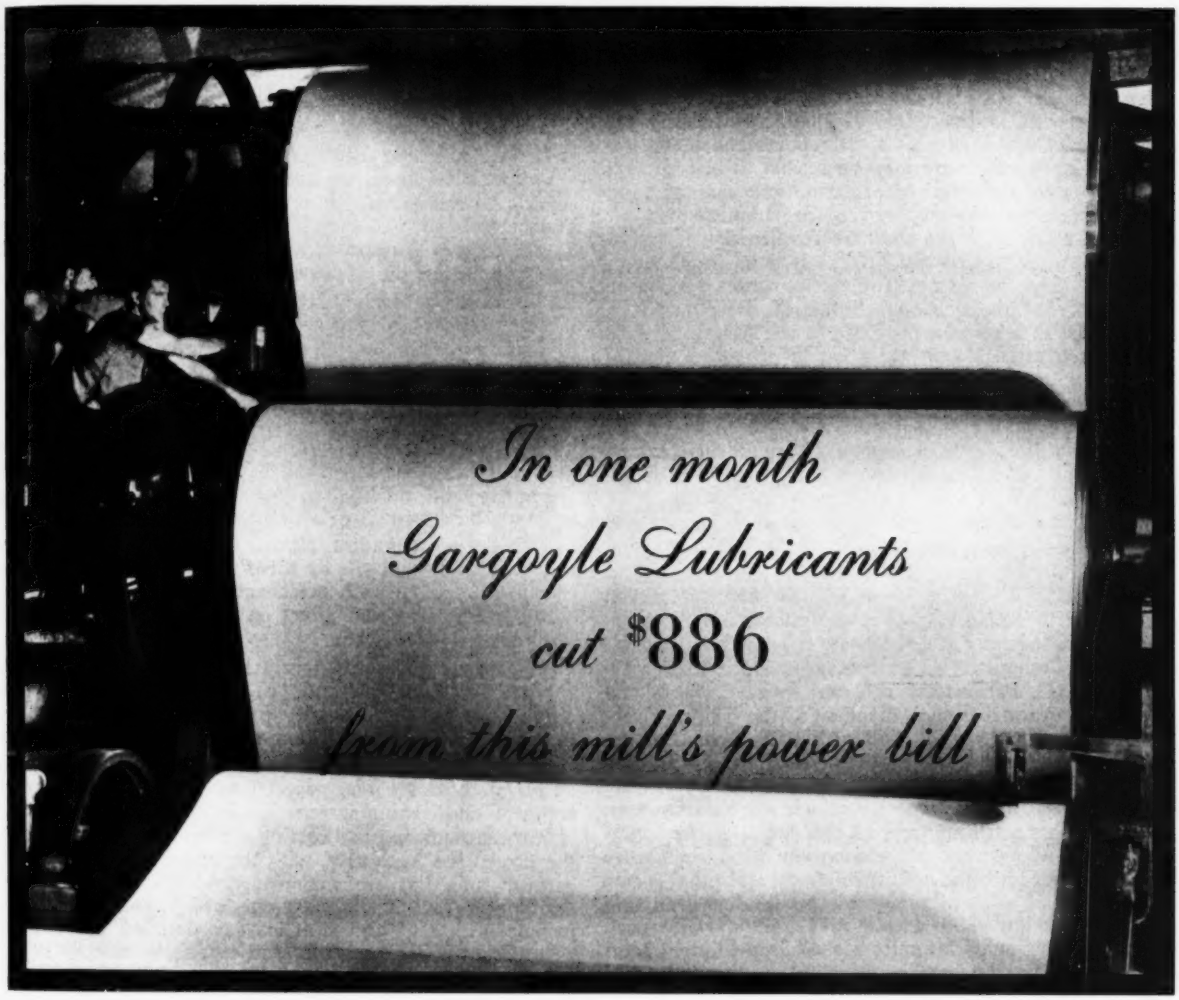
(5) Reports shall be made by the members of the Trade at the end of each month to the Executive Authority, in such detail as may be required, of the number of man-hours worked in that month by employees engaged in shipping and receiving services and elevator operators under "(4)" hereof, and by employees engaged in emergency repair work under "(2)" hereof.

(c) Pay any employee less than $15.00 per week in any city of over 500,000 population or in the immediate trade area of such city; nor less than $14.50 per week in any city between 250,000 and 500,000 population, or in the immediate trade area of such city; nor less than $14.00 per week in any city of less than 250,000 population, or in the immediate trade area of such city. These minimums shall not apply to employees who are physically handicapped, provided that such employees shall not exceed 5% of the total employees doing the same class of work. These minimums shall also not apply to office boys or girls, or to beginners or apprentices for the first 60 days' service in the trade (provided that such beginners or apprentices shall not exceed 5% of the total employees doing the same class of work, but each member of the trade having five or more employees shall be entitled to employ at least one beginner or apprentice), who may be paid not less than 80% of such minimums. Wages for part time shall be computed at proportionate rates per week not lower than the prescribed minimums. Where a state law provides a higher minimum wage than is provided in this code no person employed within that State shall be paid a wage below that required by such State law. This paragraph establishes a guaranteed minimum rate of pay regardless of whether the employee is compensated on the basis of a time rate or piece-work performance.

3. The compensation for employees now receiving in excess of the minimum wage hereby agreed to (notwithstanding that the hours worked in such employment may be hereby reduced), shall not be reduced and the pay for such employment shall be increased by an equitable readjustment of all pay schedules. It shall be the function of the Executive Authority provided for in Article III, Section 1 of the Code, to observe the operation of this provision and recommend such further provisions as experience may indicate to be appropriate to effectuate its purpose. Within 60 days after the effective date of the Code, every member of the trade shall file with the Executive Authority a statement specifying how such member has complied with these provisions in detail. Within 90 days after the effective date of the Code, the Executive Authority shall report to the Administrator in writing, specifying how the members of the Trade have complied in detail with these provisions.

Article V—Statistics—Reports

1. (a) The Executive Authority shall have power to require from the members of the Trade such reports and



This saving alone paid total oil bill *for 5 months*

It is a known fact that all the power you pay for does not directly help to make paper. In some paper mills friction of all kinds consumes as much as 50% of all power used.

You can't eliminate friction entirely. But you can *reduce* it by using Gargoyle Lubricants—products of proper film strength and film permanence. Paper mills of every type have in this way cut power consumption as much as 10%—and have saved considerable sums of money on their annual power bill.

Take the case of a certain mid-Western mill. Through the use of the correct grades of Gargoyle Lubricants, this mill reduced power consumption 43 kw.-hrs. per ton of paper—saved $886.67 (five times the amount of the oil bill) in 1 month.

When you figure that even a slight reduction in frictional resistance will more than pay your oil bill for the year, doesn't it seem well worth while to see whether Gargoyle Lubricants can lower your power costs?

A Socony-Vacuum representative will be glad to show you power savings made by Gargoyle Lubricants and Socony-Vacuum engineering service in mills similar to your own.

Socony-Vacuum Corporation, 26 Broadway, New York City. Branches and distributors in principal cities throughout the world.

GARGOYLE
Lubricating Oils

NRA

SOCONY-VACUUM
CORPORATION

statistical information as it may require from time to time to reflect conditions in the Trade, and as may be required by the Administrator. The Executive Authority shall have power through its agents or employees to inspect the books, records, and accounts of members of the Trade failing or refusing to furnish such reports and statistical information or where there may be reason to believe that such reports and statistical information are incorrect. In addition to information required to be submitted to the Executive Authority, there shall be furnished to government agencies such statistical information as the Administrator may deem necessary for the purposes recited in Section 3 (a) of the National Industrial Recovery Act.

(b) Except as otherwise provided in the Act and in this Code, all such reports and statistical information filed in accordance with subdivision "(a)" hereof shall be confidential and the reports and statistical information of one member of the Trade shall not be revealed to any other member of the Trade, and shall not be published except in combination with the statistics of other members of the Trade.

(c) The Association is hereby made the Agency for receiving and collating and publishing such reports and statistical information.

2. The Executive Authority shall, upon the application of a majority in dollar volume and numbers of the members of the Trade in any geographical region, acting through the Regional Committee appointed as provided in Section 4 of Article III, hereinafter referred to as the Regional Committee, require that each member of the Trade within the said geographical region shall within ten days after the date of the said order, file with the Regional Committee a list showing the current prices for such products as the Executive Authority may specify which are sold by such member, together with any and all discounts, rebates, concessions, and allowances of whatsoever kind or nature thereon, together with the credit, shipping, and other terms and conditions of sale. Members of the Trade within said geographical region shall within said ten days file such lists and the Regional Committee shall immediately send copies thereof to all known members of the Trade in said geographical region. Revised lists of prices and terms may be filed from time to time thereafter by any member of the Trade who filed original lists of prices and terms as aforementioned, and which revised lists of prices and terms shall become effective on the effective date therein specified, which shall not be less than ten days after the date on which said revised list of prices and terms shall have been so filed, unless the Regional Committee for good cause shown shall direct a shorter period. Copies of such revised lists of prices and terms, with notice of the effective date specified, shall be immediately sent to all known members of the Trade in said geographical region, who thereupon may file, if they so desire, revisions of their lists of prices and terms, which shall become effective upon the date when the new list of prices and terms first filed shall go into effect. No member of the Trade within the said geographical region shall sell directly or indirectly by any means whatsoever any product specified by the Executive Authority as aforementioned at a price lower, or discounts greater, or on more favorable terms and conditions, than those provided in his current list of prices and terms filed as aforementioned.

Article VI—Trade Practices

1. Except in performance of bona fide contracts in existence on the effective date of this Code, no member of the Trade shall sell any merchandise at a price or upon such terms and conditions as will result in the purchaser paying for the goods received less than the replacement cost thereof to the seller, plus the cost of distribution, according to the size of the order and the character of the sale.

2. The above restrictions shall not apply:

(a) To any sale made in closing out in good faith any stock, in whole or in part, for the purpose of discontinuing its sale, provided a statement is made to that effect on the invoice and provided such close-out stock is first listed with the Executive Authority, and no close-out stock shall be offered without the approval of such Authority.

(b) To sales of goods that are damaged or deteriorated in quality, provided that such goods are properly described by a statement to that effect on the invoice, and provided they shall be listed with the Executive Authority, and no damaged merchandise shall be offered without the approval of such Authority.

(c) To transactions with other members of the Trade provided that the same shall be listed with the Executive Authority and no such transactions shall be conducted without the approval of such Authority.

(d) To merchandise classified by the manufacturers thereof prior to its sale by them to the trade as job lots or seconds, provided such merchandise is properly described by a statement to that effect on the invoice when sold by a member of the Trade.

(e) Powers prescribed for the Executive Authority in subsections (a), (b), and (c) hereof shall be delegated by the Executive Authority to the Regional Committees to be appointed under Section 4 of Article III of this Code.

3. The Executive Authority shall immediately, upon the approval of this Code, proceed to develop a uniform accounting and costing system for the Trade, and when such uniform accounting and costing system has been adopted by the Executive Authority, with the approval of the Administrator, such uniform accounting and costing system or an accounting and costing system which conforms to the principles thereof and is at least as detailed and complete as such uniform accounting and costing system, with such variations therefrom as may be required by the individual conditions affecting any member or group of members of the Trade, as may be approved by the Executive Authority and by the Administrator, shall be installed by every member of the Trade within such time and under such terms and conditions as the Executive Authority shall then prescribe and the provisions of such accounting and costing system shall thereupon become a part of this Code. Until the adoption of such uniform accounting and costing system in the Trade, "the cost of distribution", as used herein, shall be deemed to mean and shall be made up of all the expenses of doing business permitted to be deducted under the income tax laws of the United States.

4. The following practices are declared to be unfair competition and are prohibited:

(a) Selling below published prices or terms; or selling upon prices or terms in violation of Section 2 of Article V hereof.

(b) Inducting or attempting to induce breaches of contract.

(c) False disparagement of a competitor or his goods.

(d) Guarantee to sell below competitors' prices.

(e) Imitation of trade marks or trade names of other members of the Trade.

(f) Interference with a competitor's business through the enticement of employees from the employment of such competitor.

(g) Misrepresenting, or knowingly, marking incorrectly

WITH A TUBE THAT WON'T FLAKE

THIS HOSE saves much more than its cost in its service as a hose. *It protects hundreds of times its cost in your valuable batches.*

BECAUSE ITS TUBE DOESN'T FLAKE OFF!

A new perfected and thoroughly tested Goodyear development, *Goodyear Style M Paper Machine Hose* has a specially compounded VULCANIZED TUBE.

Extra-strong ply construction, too, for withstanding pressure. Extra-strong body and cover to withstand rough usage, such as trucks running over it. Flexible and easy to handle.

Goodyear Style M Paper Machine Hose is supplied with or without integral rubber nozzle.

Like all Goodyear products for the paper industry, Goodyear Style M Paper Machine Hose is specified to your particular job by the G.T.M.—Goodyear Technical Man. Call in the G.T.M. You can get in touch with him through Goodyear, Akron, Ohio, or Los Angeles, California, or through your nearest Goodyear Mechanical Rubber Goods Distributor.

Other Goodyear Products for Paper Mill Service

- Goodyear Rubber Rollers
- Goodyear Air Hose, Water Hose
- Goodyear COMPASS Endless Belt, both Single and Double Construction
- GoodyearTHOR Belt, seamless

MADE BY THE MAKERS OF GOODYEAR TIRES

THE GREATEST NAME IN RUBBER

GOODYEAR

BELTS • MOLDED GOODS • HOSE • PACKING

any product or package as to contents, weight, dimensions, strength, grade, thickness, count or quality.

(h) Deviation from Standards or infractions in letter or in spirit of the Simplified Practice Recommendations prescribed by the Executive Authority with the approval of the Administrator.

(i) Offering for sale the product of a penal institution.

(j) Deliberately misrepresenting Firsts as Seconds or Seconds as Firsts.

(k) Falsely dating an invoice with intent to defer the date of settlement.

(l) Commercial bribery in any form, commissions or presents to employees of purchasers, over-liberal entertainment, paying or allowing secret rebates, unearned discounts, refunds, credits, concessions in the form of free goods, advertising allowances, secret transportation allowances or the like, or any other act which will directly or indirectly affect any of the foregoing acts.

(m) Making contracts for the sale of merchandise in which only one of the parties is understood to be bound to perform.

(n) Neglecting to observe and enforce, in letter and in spirit, any obligations assumed or contracts entered into as buyer or seller.

(o) To sell goods on consignment or to place goods in possession of the buyer to be paid for when sold, unless authorized by the Executive Authority due to special circumstances.

(p) Misrepresenting to any manufacturer or his agent, either as to price, terms, or other consideration, the offerings of a competitive manufacturer.

Article VII—General Provisions

1. This Code and all provisions thereof are expressly made subject to the right of the President, in accordance with the provisions of Section 10 (b) of the National Industrial Recovery Act, from time to time to cancel or modify any order, approval, license, rule, or regulation issued under Title I of said Act.

2. (a) Such of the provisions of this Code as are not required by the Act to be included therein, may with the approval of the Administration, be modified or eliminated to meet the needs of the Trade as changes in circumstances or experience may indicate to be necessary. Supplementary provisions of this Code or supplemental Codes may from time to time be submitted for the approval of the President and upon such approval shall become equally binding with this Code.

(b) Any other trade or industry claiming to be adversely affected by the provisions of this Code, or any of them may, after the approval of this Code, acting through a Trade Association or other organization truly representative of said Trade or Industry, apply to the Administrator for an exception to, exemption from, or modification of this Code as approved.

3. If any provision of this Code is declared invalid or unenforcible, the remaining provisions thereof shall, nevertheless, continue in full force and effect in the same manner as if they had been separately presented for approval and approved by the President.

4. If any member of this Trade is also engaged in any other Trade or Industry, the provisions of this Code shall apply to and affect only that part of his business which is included in this Trade.

5. This Code shall become effective for the Trade the second Monday after the date upon which it shall be approved by the President of the United States, and such date is hereinbefore referred to as "the effective date."

Code Hearings

The schedule of public hearings of the Industrial Recovery Administration for the consideration of codes of fair competition of interest to the pulp and paper industry is as follows:

October 10—Envelope Industry, in the Old House Office Building before Deputy Administrator W. W. Pickard.

October 11—Packaging Industry, at the Carlton Hotel.

October 12—Papermaking Machine Builders' Industry, at the Raleigh Hotel before Deputy Administrator Malcolm Muir.

October 16—Glazed and Fancy Paper Industry, in the New House Office Building, before Deputy Administrator Pickard.

October 17—Gumming Industry, in the New House Office Building, before Deputy Administrator W. W. Pickard.

October 18—Gummed Label and Embossed Seal Industry, in the Caucus Room of the New House Office Building.

October 19—Tag Manufacturing Industry, in the Caucus Room of the New House Office Building, with Deputy Administrator Pickard presiding.

October 20—Waterproof Paper Industry, in the Caucus Room of the New House Office Building, before Deputy Administrator W. W. Pickard.

More U. S. Pulp Goes to Japan

WASHINGTON, D. C., October 3, 1933.—A substantial increase in the American share of Japan's import trade in wood pulp occurred during the first half of 1933, the Commerce Department is advised by Assistant Trade Commissioner D. W. Smith, Tokyo.

Total Japanese receipts of wood pulp in that period amounted to 93,850 tons compared with 72,887 tons in the corresponding period of 1932, an increase of 28 per cent. Imports from the United States in the first half of the current year reached 25,342 tons compared with 13,024 tons in the corresponding period of 1932. The proportion of United States wood pulp imported in the 1933 period was 27 per cent compared with 17 per cent in 1932.

While imports from Canada increased by 54 per cent in volume in the first six months of 1933, they amounted to only 33 per cent of the total. Imports from Sweden increased 34 per cent in volume compared with last year, while Norwegian imports fell off 5 per cent.

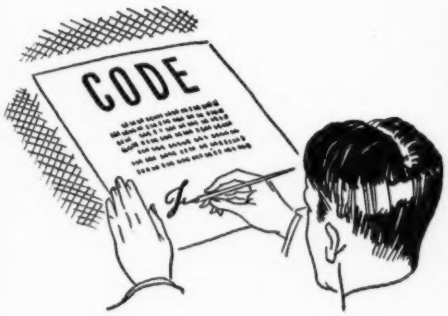
Although the official Japanese figures classify imports of wood pulp as "wood pulp intended for paper making," it is believed, the report states, that a portion of these imports were used in the manufacture of rayon, production of which has increased considerably during the last six months.

Hardwick Mill to Resume

[FROM OUR REGULAR CORRESPONDENT]

WHEELWRIGHT, Mass., October 3, 1933—Thomas Duff, superintendent of the former George W. Wheelwright Paper Company of this place but recently acquired by new owners has received word to get the plant into running condition so that the mill can be operated soon. The mill has been closed for nearly a year. It was finally sold at auction to New York parties. The mill is now to be known as the Hardwick Mills Paper Corporation. It is expected to be running in two weeks, employing from 35 to 100 hands. The mill is equipped with one 87 inch and one 102 inch Fourdrinier and has been manufacturing book, coating and music papers. Its capacity has been 25 tons in

YOU CAN ALL SIGN THIS CODE!



The key to finer stock and lower costs. This Taylor Recording Regulator controls hot and cold grinding at any desired point... produces pulp more uniform in texture, freeness, color and strength.

"Pulp Grinder temperature shall be kept uniform at all times to insure increased production of uniformly high quality stock at lowest cost." Mills carry this out with a Taylor System of Automatic Temperature Control. Read about one test

WHAT WAS once a great problem in paper mills need be a worry no longer.

Pulp grinder temperatures can be kept under complete control. Uniformly high quality pulp, and more of it, can be produced day after day at lower cost than ever before.

A Taylor System of Grinder Temperature Control is all you need. Its value has often been shown. In a recent extensive test by a large plant to determine the effect of hand operation and of Automatic Control on the capacity of a wood pulp grinder, production was increased 9% under automatic control. The system used was Taylor Grinder Temperature Control. This System was the first successful one of its type to be offered by any instrument manufacturer. Its value today is being proved day after day in many Canadian and United States mills. And is now selected to control temperature on 8 new grinders now being installed in what will be the most modern ground-wood mill in this country.

The Taylor Recording Temperature Regulator is the heart of the system. It controls temperature automatically and also gives a daily chart record for constant reference. Its durability and accuracy and money-saving ability make it one of the finest products Taylor Engineers have ever designed.

Subscribe to the Pulp Grinder Code today. Then let us give you complete data on this Taylor System. Write Taylor Instrument Companies, Rochester, N.Y., U.S.A., or Taylor Instrument Companies of Canada, Ltd., Toronto, Canada.

SPECIAL

TAYLOR NEWS FLASH

Beginning October 1st all Taylor Temperature Recorders and Recording Regulators will be shipped in a new die-cast case originated by a noted American product designer. This modern case, with many distinct Taylor improvements in the mechanism of the instrument inside, represents another step in the effort to provide industry with the most up-to-date temperature and control equipment. More later.

NRA MEMBER U.S. WE DO OUR PART

Tycos Taylor

Indicating | Recording • Controlling

TEMPERATURE *and* PRESSURE INSTRUMENTS

*The name Taylor now identifies our complete line of products, including Tycos instruments.

Bowater Interests to Reorganize Price Bros.

British News Print Manufacturers Will Control Future of Historic Enterprise—Chairman and Managing Director Eric V. Bowater Announces Company Will Retain Wholly Canadian Character—Agreement Regarded as Constructive Development

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, QUE., October 2, 1933—What is regarded as the most constructive development which has taken place in the Canadian news print industry in years is an agreement arrived at between the Protective Committee for the bondholders of Price Bros. & Co. and the Bowater Paper Mills, Ltd., news print manufacturers, of London, England, whereby the latter will reorganize Price Brothers and control the future of that historic news print and lumbering enterprise.

Formal documents embodying the terms of the agreement were signed and exchanged on Saturday and according to the statement issued on behalf of the committee formal notice will be given to bondholders and full details communicated to them as soon as the necessary steps can be taken in accordance with the deposit agreement under which the committee are acting. No intimation as to the nature of the plan was forthcoming from the interested sources, but the suggestion was heard that after ample provision for holders of the bonds and some equitable basis of settlement with the creditors, holders of the preferred and common shares would be permitted to subscribe to new shares on the same basis as will be provided the Bowater interests.

Lengthy Negotiations Closed

The agreement brings to a close negotiations which have been proceeding for months during which consideration was given to a variety of proposals looking towards the reorganization and rehabilitation of the company. Those who had participated in the move to gain control of the company included the Duke-Price Power Company, which furnishes Price Brothers with power, and is controlled by the powerful Aluminum Company of America, with the latter interests supported by Lord Beaverbrook, publisher of the *London Daily Express*, who takes a substantial portion of Price Brothers' news print output, and is also reported to hold a substantial stock interest in the company. Other interests participating in the negotiations was a syndicate headed by R. O. Sweezey, well-known engineer and financier.

Eric V. Bowater, chairman and managing director of Bowater Paper Mills, announced in an interview here Saturday that it is desired and intended that Price Brothers shall retain its wholly Canadian character, and that the company should be operated by a board of directors composed of representative Canadians. As in the past, however, there will be some British representatives on the board. He said his company had become interested in Price Brothers primarily because he counts the Dominion as the most natural news print field in the world, liberally endowed with requisites for production and adjacent to the huge United States market for news print. While of the opinion that the United States is the natural market for Canadian paper, Mr. Bowater indicated in answer to a query that under existing conditions his company, with its wide marketing facilities, might readily find an outlet for a substantial amount of Price news print.

Bowater Paper Mills was founded 55 years ago, and is now the predominant news print producer in the United Kingdom, having a capacity of 1,000 tons a day. The company operates two mills, each with a capacity of 500 tons a day, one being located on the Thames near London and the other on the Mersey, between Manchester and Liverpool. The company's distribution system includes offices in Europe, South Africa, Australia and India.

Strong Financial Position of Bowater's

Mr. Bowater states that in spite of conditions so generally ruling in the news print industry, his company has maintained dividends on its preferred and common stock. The company occupies a strong financial position, as attested by the fact that the bonds of the company sell to yield 4¼ per cent, while the common, which is listed on the London Stock Exchange, sells currently at a price to yield approximately 5 per cent. The capitalization of the Bowater group is in excess of $20,000,000.

Price Bros. & Co. defaulted interest on its funded debt on August 1, 1932, and the protective committee which was formed to represent holders of $11,000,000 of 6 per cent first mortgage bonds was made up as follows: Ross H. McMaster, J. H. Eccles, both of Montreal; the Hon. John Hall Kelly, Quebec; Thomas Bradshaw, Toronto; W. M. Dodge, New York, and W. E. McGregor, Boston, chairman. This committee, it has been indicated, represented over $8,000,000 of the bonds. On application of the Duke-Price Power Company, the company was adjudged bankrupt and placed in the hands of the Hon. Gordon Scott, as receiver, on April 10 of this year.

Selden Co. Gets Decision

The United States Circuit Court of Appeals for the Third Circuit, on September 20, handed down an opinion in the case of the General Chemical Company vs. the Selden Company, appealing from the District Court of the United States for the Western District of Pa., affirming the decree of the lower court.

In the court below the General Chemical Company, owner of patent No. 1,371,004, applied for October 9, 1914, and granted March 8, 1921, to Franz Slama, a citizen of Austria, and Hans Wolf, of Germany, charged the Selden Company with infringement thereof. That court held the seventh claim void and the other claims not infringed. Thereupon plaintiff took this appeal. The patent concerns the manufacture of sulphuric acid.

Gordon Fox Returns From Russia

Gordon Fox, who has been associated with the Leningrad staff of Freyn Engineering Company, has returned to the United States, and will resume his connection with the American activities of this company. Mr. Fox has devoted the last five years to engineering work in the Soviet Union for Freyn Engineering Company, during which time this company, in association with the Russian organization, Gipromez, has supervised the development of the steel industry of the Soviet Union, and has directed the design of blast furnaces, open hearth and bessemer works, rolling mills and associated departments for all the major plants of this nation. Mr. Fox was identified with the power and electrical phases of this work.

Philadelphia Paper Market Continues Listless

Industry in General Passing Through Period of Uncertainty Which is Curtailing Buying—Despite Unsettling Factors Belief is Generally Expressed That Recovery Will Proceed Cumulatively—Lower Grades of Paper Stock Decline

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., October 2, 1933—Mild disappointment but with no evidence of discouragement expresses the mental attitude of the paper distributors towards the business of the past week. Stronger disappointment but likewise no discouragement was also evidenced in the paper stock branch of the business in which, for the first time in a period of several months, there came considerable price recessions. While the business week was broken by a series of holidays very largely affecting consumers, sales failed to come up to the point where expectation had placed them. It is not to be assumed that this fact involves actual dullness, but it is true that neither in fine paper nor coarse paper was there manifest any snap such as Fall usually brings with it.

The most optimistic report heard in a tour of the trade was that despite all the holidays and labor difficulties, September closed with a record quite equal to that of August, and when it was suggested that ordinarily September should exceed August, the encouraging answer was that August had been unusually high.

Throughout this great industrial city there are at least a half dozen industries, heavy consumers of both fine and coarse papers, whose production has been restricted by labor contentions, and moreover because of delays, probably unavoidable in the final approval by the Government, of various industrial Codes, all industry is passing through a period of uncertainty which is having a decidedly repressing effect on buying. All in the trade, however, believe that these unsettling factors are merely transient and there is virtually no weakening of the belief that recovery will proceed cumulatively.

The outstanding development of the week in the paper stock business was the decline in all the grades of old papers of a cheaper character than old kraft. Commons, mixed straw-board and binders board chip, corrugated board, overissue news and old newspapers—all went off from 10 to 15 cents a hundred. In diagnosing the reason, the best informed in the trade are of the opinion that it is not ascribable to any one cause but to a series of them. Primarily, of course, the prices went down because of the very decided falling off in mild demand, and behind that lies several reasons. It is known that the large majority probably of all the board makers suffered loss of greater or less extent because of the storms and floods of recent weeks, and many of these are now engaged in the re-manufacture, out of damaged stock, of new boards.

Holidays cut down production too, and the shorter hours now generally in force in the mills, not as a result of Governmental regulation, but of volunteer agreement, are the causes for decreased output and curtailed demand for paper stock. Though the decline in price was generally in cheaper grades of stock, thus far the better grades have not been affected. The trade is most anxiously awaiting the developments of the present week in order to ascertain by the position taken by the better grades of stock, whether falling off during the week is to be described simply as a flurry or as a recurrent period of actual dullness.

Paper and Cordage Outing Successful

There is no precedent in all Philadelphia paper trade history for the good fellowship and enthusiasm shown by all the members of the Philadelphia Paper and Cordage Association with their Fall outing at the Bankers Country Club, Ambler, on September 26. Not only was it in point of mere attendance by far the largest affair of its kind in which the association ever participated but it stands without previous achievement in the one hundred per cent representative character of the industry which the attendance showed and in the harmony and good will manifest. Members of the trade who, before entering into the association, have looked on each other with suspicion, found they had a common purpose, and through the sociability of the outing found a good fellowship that hardly was even suspected before. Sporting events started promptly at noon and continued until after six o'clock when dinner was served, and it was followed by the presentation of prizes for various events. The Hooper golf trophy which was given for the Low Gross score was won by Arthur Brosius, former star golfer from Duke University. Mr. Brosius is now located with Satterthwaite-Cobaugh; he played an excellent game to win out.

Low net score was won by Edward Satterthwaite, who has been a famous golfer in the Philadelphia district for many years. He was formerly South Jersey champion and also winner of the prize Leslie Cup. Kickers Handicap was won by Mr. Bankcroft. The runner-up in the Kickers Handicap was Howard Satterwaite, who also had a splendid round. H. B. Fitler was the winner of the prize for the most Birds in the round. C. A. Wilder was the winner of the special total medal score. H. G. Kleinfelter was the winner of the highest amount of strokes on any one hole.

The Tennis Tournament turned out some very good players and in the elimination of the Club champion, H. K. Hooper was supplanted by Mr. Richmond of E. Latimer Company. The winner of the finals was Norman Hall of the Fricke Company, also of the Philadelphia Rifle Club. He played a very splendid game and deserved to win. There was a battle in Quoits fought under the trees of the Club, and when the smoke had cleared away, Louis Kelly and Raymond Hunter were the doubles winners. In the finals, Raymond Hunter won the Singles champion. Mr. Hunter is with the Frank W. Winne & Son organization. One of the main events was the battle between the Cordage and Paper golf players; this has not reached its final status and will be played off at a later date. Arthur Sherrill, of D. M. Bare Paper Company, led in the singing. Mr. Sherrill is a singer of prominence and was in very great demand. During the course of dinner he engaged in very hearty repartee with James Andrews of the Schuylkill Paper Company.

Coarse Paper Merchants Discuss Code

Another evidence of the enthusiasm and good fellowship in the trade was given by the meeting during the week of the Coarse Paper Division of the Philadelphia Paper Trade Association. By actual count there were represented twenty houses, virtually all engaged in this business in Philadelphia. The meeting, which ordinarily lasts but an hour or so, continued from 12.30 until 3 o'clock. It was presided over by Butler Smythe, of the J. L. N. Smythe Company, who received the reports from the several committees par-

ticularly active in all the branches of the business, these being Kraft, Gummed Tape, Tissues, Towels and Toilets, Twine, and Miscellaneous. The reports and consequent discussions brought out the fact that there has been a considerable quietness which had appeared during the last week or two, but that there was nothing in the situation to cause alarm. The remainder of the meeting was given over to a discussion of the Code of the Paper Distributors, as reported in the PAPER TRADE JOURNAL.

Paper and Bag Division Meets

The Paper and Bag Division of the Philadelphia Paper Trade Association held its meeting during the week at the Broadwood Hotel, and despite the humidity of the weather fifty representatives turned out. H. J. Hogg, of the Hogg Paper Company, who presided in the absence of William A. Hentz, who was called out of town, brought a very splendid and encouraging message to those in attendance. He said that he had contacted the distributors and they gave him their promise of a hundred percent. cooperation with the problems of the jobbers. The various committees discussed a check-up which they made and it was learned that this brought out the fact that 90 per cent of the jobbers belonging to the Philadelphia Paper Trade Association are living up to the ethics as prescribed by it. The United Twine Company, Lancaster, Pa., and the Delaware Novelty House, of Wilmington, Del., were accepted into membership. William Stark, local representative of the Union Bag and Paper Company, who had attended one of their former meetings, expressed his delight with the progress that had been made during the interim of his visits.

Cotton Textile Manufacturers Testify On Tax

WASHINGTON, D. C., October 4, 1933—An appeal that the processing tax on cotton used for certain purposes be abated or that a compensatory tax be placed upon paper was made Monday and Tuesday by representatives of the cotton textile industry at a hearing called by the Agricultural Adjustment Administration with reference to processing taxes on commodities in competition with cotton.

The hearing is being presided over by D. S. Murph, chief of the cotton processing and marketing section, and is supplementary to one held July 31 and August 1.

Commodities to be considered at the hearing which is being held under Section 15 (d) of the Agricultural Adjustment Act includes paper, jute and a group of hard fibers such as hemp, sisal, henequen, abaca, istle or ixtle, phormium, kipak, crin vegetal, sunn, cantala, piteria and coir or piassava.

Session Confined To Subject of Paper

One session was confined to the subject of paper with George A. Sloan, president of the Cotton Textile Institute, directing the discussion and introducing witnesses from the cotton industry who advocated that the cotton processing tax be abated or a compensatory tax be levied on paper.

The first witness for the cotton industry was Norman B. Elsas, of Atlanta, Ga., president of the Fulton Bagging Company, who advocated that the tax on cotton manufactured into bags be abated. He asserted that there was no formula whereby the range of competition could be established because the competitors of cotton bags ranged "from tobacco tins to flour sacks."

Mr. Elsas cited instances in which, he claimed, the processing tax on cotton had caused cancellation of orders for cotton bags, and containers manufactured from competing fibers had been substituted. He claimed that an increase on cost of 5,000 bags used for sacking meal was $14.90 of which $13 was processing tax and $1.90 increased labor costs under the textile code. He concluded his evidence with a plea that the processing tax be abated "and the economic equilibrium restored."

Substantiating Mr. Elsas' testimony was a statement from Cason J. Callaway, cotton textile manufacturer from LaGrange, Ga., who said that he formerly manufactured his own cotton bagging for shipping purposes but that the processing tax had caused him to use burlap because of the lower cost.

Causing Shift from Cotton To Paper Towels

At the afternoon session, Mr. Sloan introduced witnesses who claimed that the processing tax on cotton was causing a shift in consumption from cotton towels to paper towels.

Jonas Mayer, president of the Chicago Linen Supply Corporation, asserted that "paper competes with us on the basis of price." He said that his industry, which provides towel service in the major cities of North America, consumed some 420,000,000 yards of cotton goods annually. The processing tax on cotton, he claimed, increased the cost of the service by 2½ per cent. "Our only alternative," he said, "is to increase the price to our customer or to reduce our profits." Mr. Mayer said that the 2½ per cent increased cost, if absorbed, meant a reduction of 33⅓ per cent of the corporation's profits.

He claimed that numerous large customers who had been using cotton towel services were substituting paper. He cited the Sears-Roebuck Company as an example, stating that their purchasing agent had declined to pay the increased cost of 2½ per cent and had substituted paper towels.

Under the order of procedure read by Chairman Murph at the beginning of the hearing, representatives of the paper industry will be heard after the presentation of the cotton textile industry's testimony on this point. The next commodity to be taken up will be jute.

Mr. Brown Completes 42 Years of Service

MONTREAL, Que., September 30, 1933.—William J. Brown on September 22 completed a record of forty-two years of continuous service with one company and its successors in the pulp and paper industry. Mr. Brown entered the employ of the Laurentide Pulp Company, Ltd., September 22, 1891, under the management of John Forman and has continued ever since in the employ of its successors, the Consolidated Paper Corporation, Ltd., and the St. Maurice Valley Company, Ltd. He has served in all the various departments and is at present employed in the sales department.

Mr. Brown is held in high esteem by all the officers and staff of the company and holds as well the good will of the company's customers.

H. G. Craig & Co. Elect Officers

At the regular monthly meeting of the board of directors of H. G. Craig & Co., Inc., held at the office of the company, 230 Park avenue, New York, N. Y., September 20, 1933, the following were elected officers and directors to serve until the next annual meeting of the corporation: Tom T. Waller, president; Edward H. Watson, vice president and sales manager; Nathaniel L. Miller, treasurer; Emil Dillmann, secretary; and Alvah L. Miller, director.

Control Over Lime Recovery Operations

By M. B. Mount[1]

The calcination of the precipitated sludge resulting from the causticization of an alkaline solution with lime in the production of digester liquor is not new to the pulp and paper industry. A few mills have operated plants for the recovery of lime sludge for ten years or more; nearly 50 per cent of the soda and sulphate mills in the United States have such plants at the present time. Yet there are few processes connected with paper-making which are less understood.

What, to the uninitiated, may appear to be a very simple operation is, in reality, a very complex one, one in which no single step in the process can be neglected. If success is to be attained the plant must not only be properly designed but it must also be properly operated. Although I have had personal contact with ten lime recovery plants, including the first successful one to be built, and have been more or less intimately acquainted with several others I do not know of a single one which operated perfectly at the outset.

No matter how carefully the operatives may be instructed in their duties, no matter how earnestly those responsible may be urged to pay strict attention to detail, some factor will be overlooked or regarded as unimportant and there will be trouble. The price of success is unremitting attention to detail, a positive control over each step in the process as well as over those connected processes, such as causticizing, which have a bearing upon the lime recovery operation.

A lime recovery plant, to be successful, cannot be regarded as an adjunct to the liquor making process; it must be accepted as an integral part of that process.

In this article I shall deal with some of the troubles which are had with lime recovery plants, explain what causes those troubles and how they can be prevented. I hope that those who are interested may find something of value in my observations which reflect the practical experience gained in twenty years of lime recovery plant design and operation.

Ring Formation in Kilns

One of the most common troubles is the ringing up of the kiln. The best way to get rid of rings after they have formed is to shut down the kiln, get inside with pick and bar, and break them out. Some have tried machine guns, others have tried buck shot, at least one has installed cast iron plates, held to the interior of the shell by springs, which can be jolted from the outside. All of these devices can be regarded as expedients to cure a symptom; none of them gets at the root of the disease.

The logical, the correct thing to do is to prevent the formation of rings. This can be done by regulation of the kiln feed, by seeing to it that nothing but the right kind of sludge goes into the kiln.

Practically all lime recovery kilns are fed by a rotary vacuum filter which discharges into a feed screw. This screw, which is located in the flue covering the end of the kiln, should be as short as possible in order that the filter cake may be gotten into the kiln with the minimum amount of repulping. The filter serves a dual purpose: it washes the alkali out of the sludge and it dries the sludge by the removal of water. Let it fail to do either of these two things and there will be trouble and it does not take long for the trouble to show up.

Let the filter cake become wet and slimy, indicating high moisture content and usually high alkali content as well, and a ring is apt to form within four or five hours.

As a rule the filter is not to blame when this condition arises. While some filters are better adapted to lime recovery operation than others, no filter will perform satisfactorily if it is not kept in good condition, if the water sprays are not kept in proper order, if cold water is used for washing, if the vacuum pump will not maintain sufficient vacuum or will not pull enough air through the filter to dry the cake. Nor will any filter perform satisfactorily if the sludge delivered to it is not suitable for filtering.

It so often happens that, with the filter in good condition, with the sprays working perfectly, with the proper amount of vacuum on the system, the cake will go bad. Almost invariably the sludge is responsible.

A cold slimy sludge cannot be satisfactorily washed on a rotary vacuum filter. Nor will a rotary vacuum filter satisfactorily handle a sludge containing an excessive amount of free (uncombined) lime. The sludge should be hot, at or near the boiling point. Its free lime content should not be in excess of 5 per cent.

When a ring begins to form in the kiln, do not get out the machine gun, but make an investigation and find out what is causing it to form. In almost every instance the trouble will be found in the feed. If there is nothing wrong with the filter it is safe to say that the sludge is at fault and that takes us to the causticizing department.

Influence of Causticizing

Very few inexperienced lime recovery plant operators can be made to understand how causticizing can have anything to do with a ring in the kiln and their tendency is to try to find expedients to break up rings after they have formed instead of straightening out their causticizing operation. Strict control over causticizing is just as essential to success in lime recovery as control over the combustion of fuel in the kiln.

It is well known that the reaction between sodium carbonate and calcium hydroxide by which sodium hydroxide is formed is a reversible one. To be sure that the hydroxide does not go back to the carbonate most operators add a little more lime than is necessary to complete the reaction. In some cases the excess is considerably higher than it need be; in one instance which came under my observation the excess over a period of weeks averaged 13 per cent and occasionally went as high as 23 per cent. The waste of lime is the least serious factor in this practice; any lime used that amounts to more than two or three per cent excess is wasted, as far as the causticizing of the liquor is concerned, and makes for trouble in other directions.

Calcium hydroxide is so finely divided as to be almost slimy in sludge form whereas calcium carbonate is definitely granular; consequently the latter will settle more rapidly than the former. A tank of causticized liquor containing a large amount of uncombined lime will require a longer period to settle, if it can be made to settle at all, than will a tank of liquor which has been properly causticized with not more than 5 per cent excess lime.

Disregarding the effect which careless causticizing may

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[1] Assoc. member TAPPI, Mount Chemical Equipment Company, Lynchburg, Va.

have on lime recovery, mill superintendents should see to it that their liquor is properly boiled and agitated and that no more lime than is needed be used. It will pay them handsomely.

But in mills where there are lime recovery plants, good causticizing is absolutely essential. Sludge containing an excessive amount of free lime cannot be filtered successfully; it will not wash clean nor will it dry. Consequently, the alkali and moisture content of the cake going into the kiln is high and trouble quickly ensues; sodium silicates, which cut down the quality of the lime, are formed and rings quickly develop.

It cannot be said that poor causticizing is responsible for all rings but it is certain that it is the cause of many of them. Since the causticizing operation is one factor in the cycle that can be definitely controlled there is no excuse for inviting trouble by failure to control it.

Before I leave the subject of kiln feed I wish to touch upon the necessity of regulating the amount of sludge charged. It should be obvious that if the filters are feeding a cake one inch thick into the kiln the lime produced will be different from that obtained when a cake only a half inch thick is being charged, other factors remaining constant. Care should be taken to deliver to the filters a sludge uniform in consistency. If the sludge is being thickened in a continuous decanter it will ordinarily be of more or less uniform consistency whereas if it comes from batch settling tanks the operator can bring the consistency of the sludge to the desired point before he dumps the tank. Strict attention to this detail of operation will have a very beneficial effect on the quality of the lime.

It is advantageous to have the filters arranged so that they can discharge their cake into the sewer if, for any reason, it is not desirable to put it into the kiln or if the latter is down.

Quality of Make-up Lime

In the operation of a recovery unit it is necessary to add, to replace process losses, from 10 to 20 per cent of fresh lime or its equivalent in calcium carbonate. It is axiomatic that no recovered lime can be better than the makeup lime added. As a matter of fact, recovered lime will ordinarily be from two to five per cent lower in available calcium oxide than the fresh lime used. One southern kraft mill has a record of producing recovered lime over a period of several months that averaged 92 per cent available CaO. This represents excellent operation. In this case only the best of fresh lime was used for makeup. The company paid a price higher than the average to obtain lime of the desired quality.

All limes are not equally satisfactory for causticizing. Of two specimens of identically the same chemical analysis, one will show marked superiority over the other in reactivity and settling qualities. It may be said that a high calcium lime made from coarsely granular stone will prove more suitable than one made from a stone of fine texture; the former will usually settle more rapidly than the latter. The ideal lime, both for bleach-making and for causticizing, is one containing 95 per cent, or better, calcium oxide and less than one per cent magnesium oxide which will react quickly and settle out rapidly, leaving a clear solution.

Closely connected with the factor of quality of product is the factor of per cent of recovery. If conditions of operation are such that high grade lime is being produced the per cent of recovery will be high also. In a preceding paragraph I indicated that the percentage of recovery will be from 80 to 90 per cent. The superintendent of what is probably one of the most profitable recovery units in the pulp and paper industry has this to say concerning per cent of recovery: "I am certain that I could go into almost any recovery plant and obtain over 90 per cent recovery but it would not be conservative to estimate that this would be done in a pulp mill starting up a recovery system where the operating men are more or less inexperienced."

An intelligent operator will soon learn the importance of strict attention to detail and the necessity of establishing and maintaining uniform conditions. Such an operator can get results out of a kiln unit that would be beyond the reach of an inexperienced man but even he will be helpless if he does not have the full cooperation of the liquor maker.

There is not much to be said on the subject of kiln firing. Producer gas, oil, natural gas, and pulverized coal are used as fuel with their desirability ranking in the order that I have listed them. Pulverized coal leaves most of its ash in the lime and is usually hard on the kiln lining. Natural gas, with its high calorific value, must be carefully handled to prevent overburning of the lime. Its chief virtue, where it is used, is its low cost. Oil is not used in many mills because of its relative high cost but it produces a satisfactory flame for the purpose if the right kind of burner is used; just any kind of an oil burner will not do. Producer gas is the ideal fuel because of its low calorific value. With any type of fuel it is important to obtain a long, lazy flame that will extend well back into the kiln. Concentration of heat is to be avoided.

Sealing rings on both ends of the kiln are a real help in draft regulation and save fuel. Recording pyrometers are almost indispensable in maintaining uniform temperatures. These instruments are far more reliable than the "jedgmatical" eye of the fireman; moreover they afford the superintendent a continuous and permanent record of conditions in the kiln.

Recovered lime, even the best of it, is more or less overburned; consequently, it does not slake readily when cold. It is not advisable, for this reason, to store it for any considerable length of time. As a matter of fact, it is not necessary to have a storage bin in connection with a recovery kiln. The ideal arrangement is to allow the hot lime to go direct to a slaker or to the causticizing tanks. I personally prefer a slaker between the kiln and the causticizer; with the continuous system of causticizing the slaking must be done separately. Separate slaking makes it easy to remove impurities before the milk of lime goes to the causticizer.

There is much difference of opinion as to whether the lime should be slaked in water or in green liquor but I think everyone will agree that the liquor should be clean when it finally comes into contact with the lime. Liquor produced from "green ash" in a soda mill, and unclarified green liquor in a kraft mill will both cause trouble. The colloidal matter and other impurities in such liquor have a bad effect on the entire operation and most of all on the quality of the lime. The impurities in kraft mill green liquor are so deleterious that lime recovery cannot be successfully carried on unless they are removed. This can be accomplished readily by settling or filtering. There should be adequate storage for green liquor ahead of the causticizer. I am of the opinion, although I have no way of proving my theory, that the benefits in other directions to be derived from green liquor clarification justify its being done irrespective of the effect which it will have on lime recovery.

The reader will have observed that the theme of this article is uniformity of conditions and control over each factor which affects operation. There can be no substantial economies effected through the installation and operation of a lime recovery plant if there are to be fre-

quent and wide fluctuations in the flow of materials through the unit, and this applies to the causticizing operation as well as to all other steps in the process. It is not difficult to control the variables by means of chemical tests.

Each tank of causticized liquor should be tested for causticity and free lime before it is released. If a continuous causticizing system is being used, the same tests should be made at regular intervals.

A simple testing outfit should be provided for the kiln fireman by means of which he can determine the calcium oxide content of his lime at regular intervals. The use of pyrometers to help in the regulation of kiln temperatures has already been mentioned.

Filter operation should be checked by keeping a representative sample of the washed cake which, at the end of each shift, should be taken to the laboratory and analyzed for moisture content and total alkalies. Moisture content should not be allowed to exceed 40 per cent on the dry basis and alkali content 0.5 per cent, computed as Na_2O, for good kiln operation.

Copies of all control tests should be posted where the operators can see them and the shift foremen should see to it that the operators hold the apparatus for which they are responsible to the standards set. There is no reason why a good record attained one day cannot be equalled, if not bettered, the next day.

John H. Hollingsworth Dead

FULTON, N. Y., October 3, 1933—John H. Hollingsworth, Fulton industrial leader, died September 27 at his home, 184 South Third street, after an illness of about four weeks.

Mr. Hollingsworth had not been in good health in several years, but it was only four weeks ago that he retired to his home.

Mr. Hollingsworth was president of the John H. Hollingsworth Paper Company, operating plants in Phoenix, and until stricken ill he was active in the directing of the affairs at that mill.

Mr. Hollingsworth was a native of Wilmington, Del., and for many years resided at Niagara Falls, where he was engaged in the manufacture of paper. In September, 1899, he moved to this city, where he became superintendent of the Oswego Falls Pulp and Paper Company, now known as the Oswego Falls Corporation. He continued as an official of this plant since, being a director in the corporation at his death.

In April, 1929, with his son, Jay Hollingsworth, he purchased the old Crescent Paper Mills at Phoenix, where he effected a complete reorganization and has since manufactured tissue paper.

Mr. Hollingsworth was a member of the first Methodist Church of this city. He was a member of the Masonic order, being affiliated with the Frontier Lodge at Niagara Falls. He was a life Republican and had been an active worker in the affairs of that party. For several years he served as a police and fire commissioner of Niagara Falls.

Mr. Hollingsworth was married October 17, 1883, and soon, with Mrs. Hollingsworth, would have celebrated his golden wedding anniversary.

Surviving Mr. Hollingsworth is his widow, Mrs. Phena Hollingsworth; one son, Jay Hollingsworth; two granddaughters, Miss Charlotte Hollingsworth and Miss Manette Hollingsworth, all of this city; two brothers, William Hollingsworth of Fulton and James Hollingsworth of Jacksonville, Fla.; three sisters, Mrs. Arthur Calder of Chicago Heights, Ill., Mrs. William Wright of Herkimer and Mrs. Charles L. Lee of Buffalo.

W. B. Bullock Addresses Paper Salesmen

There was an excellent attendance at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry, which was held at the Woodstock Hotel, New York, on Monday last. The guest speaker, Warren B. Bullock, manager of the Import Committee of the American Paper Industry, gave an interesting and very informative address on "Foreign Competition Under the National Industrial Recovery Act," which was deeply appreciated by all present.

Mr. Bullock declared that imports of paper had increased materially since the beginning of the year and cited many complaints and cases which had been handled by the Import Committee. "Higher manufacturing costs will be forced by the operation of the National Industrial Recovery Act," said Mr. Bullock. "Price increases, to permit a profit under this increased manufacturing burden would, without restriction of foreign competition, merely make our market more attractive to the foreign producers. Instead of bringing about domestic industrial recovery, the Act will, if foreign competition is unrestrained, serve to bring prosperity to foreign mills, with no benefit, if not actual damage, to the domestic manufacturers."

The speaker explained that foreign as well as interstate commerce is included in the operation of the act, and that the United States Tariff Commission is to conduct the investigations needed to prevent unfair foreign competition. In extreme circumstances, stated the speaker, the President may declare an embargo against foreign merchandise.

Mr. Bullock assured the gathering that in order to work properly under the conditions which will result from the National Industrial Recovery Act, the Import Committee is keeping abreast of all developments so that it can take the necessary steps to prevent the Paper Industry Code from being made futile by a foreign invasion of domestic markets.

"It will readily be seen that the National Industrial Recovery Act can not be made effective unless adequate precautions are taken to prevent the flooding of the domestic market with low-priced foreign goods," said Mr. Bullock. "These precautions are already being taken by the Import Committee, which, meanwhile, will continue with unabated vigor its efforts to check evasion of the existing tariff laws."

St. Helens Mill Adds Workmen

[FROM OUR REGULAR CORRESPONDENT]

ST. HELENS, Oregon, September 30, 1933—The St. Helens Pulp and Paper Company started operation on the paper makers code September 1 and more than 70 additional workmen were added to the payroll. Four shifts will be employed and work will be rotated with men working 40 hours a week at a minimum wage scale of 40 cents an hour.

Including the bag factory the company employs more than 500 operatives.

S. M. Arnold Goes With Geo. W. Millar

Geo. W. Millar & Co., paper mill supplies, 284 to 290 Lafayette street, New York, announce that S. M. Arnold, formerly with D. L. Ward Company, of Philadelphia, in the northeastern Pennsylvania, southwestern New York and northern New Jersey territory, will represent this company in the same territory. Mr. Arnold will make his headquarters in Sommerville, N. J., from which point he can very easily reach these sections.

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UPWARD TREND IN FOREIGN TRADE IN PAPER AND PULP

Exports of paper and paper products from the United States during the month of July again registered a slight gain in value, exceeding the June figures by 11 per cent and those of the corresponding month in 1932 by 4½ per cent, according to the Lumber & Paper Division of the Department of Commerce. In fact, the July total of $1,259,668 is the highest of any month in the past year. Compared with twelve months ago this rise represents a higher average price rather than an increase in volume, the latter, in fact, having declined by about 20 per cent. This statement also applies, but to a lesser extent, when the comparison is made with the June shipments. The increase of 11 per cent in the July over the June shipments shrinks to 5½ per cent when the comparison is made on a quantity basis.

Increase in the volume of shipments during July were registered principally in the line of paper specialties, such as toilet paper, towels and napkins, and paper bags. One item which has tended to bring up the total of the July shipments is over-issue newspapers, exports of which show an increase of nearly 45 per cent compared with those of June.

Imports of standard newsprint into the United States during July, which totaled 163,434 tons, exceeded the June receipts by 14 per cent and those of July, 1932 by 17 per cent. The decline in newsprint prices between July, 1932 and July, 1933, however, brought about a decline in the value of these receipts by 6 per cent. Imports of the remaining classes of paper and manufactures, which represent only 10 to 15 per cent of the total, show an increase in value during July of 15 per cent compared with the preceding month and of 19 per cent compared with July, 1932. Imports of printing papers other than newsprint, and of kraft paper declined, but other leading classes, which include cigarette paper, writing papers, other wrapping papers, tissue papers, and boards show substantial increases. The total value of paper imports during July reached $7,039,154, of which $6,283,615 represented newsprint and $755,539 other classes of paper and manufactures.

The increase in receipts of paper base stocks during July, however, far outstripped that in paper and boards. Imports of pulpwood, which were valued at $905,029, show an increase of 78 per cent over June and 44 per cent over July, 1932 receipts, while imports of wood pulp, rags, old rope, and other stocks, valued at $6,024,353, were 34 per cent above the June and 152 per cent above the July, 1932 receipts. Unlike paper and boards, the increase in the value of paper base stocks was accompanied by a corresponding increase in volume, while the rise in imports of the higher-priced sulphite and sulphate pulp was somewhat greater than in the case of mechanical groundwood. At the same time, the former represented 78 per cent and the latter 10 per cent of the July receipts, the remaining 12 per cent comprising chiefly rags, with some old rope, bagging, and waste paper. Total imports during July came to 203,047 tons as compared with 150,656 tons in June and 69,784 tons in July, 1932.

PROPERTIES AND COATING QUALITY OF COMMERCIAL CASEIN

Why some makes of casein cause foam in applying clay coatings to paper is a mystery that must be solved before much progress can be made in efforts to increase the volume of production and value of domestic casein. This is the conclusion reached as a result of research made by the Bureau of Dairy Industry and the Bureau of Standards, the results of which are reported in the August issue of Industrial and Engineering Chemistry.

The chief use of casein, which is briefly the washed and dried curd from soured milk, is as the adhesive for clay and other mineral coatings that form the excellent printing surfaces on paper intended for half-tone work and other high-grade printings. Mineral coated paper is expensive and considerable waste results if the casein is not of uniform and high quality. The Bureau of Dairy Industry is endeavoring to minimize waste in both the dairy and the paper-coating industries by obtaining more exact knowledge of the essential coating properties and of the best way to obtain them.

As a preliminary step, samples of representative domestic caseins were given exhaustive laboratory tests by the Bureau of Dairy Industry, and the services of the Bureau of Standards were enlisted to secure experimental coating tests of the caseins in its paper mill. Finally, tests of the printing quality of the different coatings were made by the Government Printing Office.

The coating quality of the caseins, while generally good,

was found to vary considerably. But estimation of their coating quality by laboratory tests appears to be an elusive matter, for although all of the tests commonly used by paper coaters and several in addition were employed, neither the chemical nor the physical properties tested bore much relation to the major differences in coating quality found. The chief defect found in using the caseins was that some of them caused foam in the coating mixture of casein, clay and water. Foam results in a mottled coating which is entirely unsuitable for use. Furthermore, foaming tendency apparently bore no relation to the method of making the casein or to the coating procedure employed. Another unexplained fact in this connection, which is utilized commercially and which occurred in these experiments, is that when caseins that cause foam are mixed with those that do not, the blend usually yields satisfactory coatings.

The need for suitable standards of quality for casein evidenced by the results of this study, is reflected in responses to inquiries on the subject addressed to paper coaters, because for nearly every positive statement made by one paper coater, there is a contradictory statement by another. Further effort is to be made to develop such standards, with particular attention to the chief stumbling block—the "why" of foamy casein.

Alexander Thomson Heads Chamber

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, October 2, 1933—Alexander Thomson, president of the Champion Coated Paper Company, Hamilton, who has been out of the city for some time, was advised this week of his election to the presidency of the Hamilton Chamber of Commerce. In accepting the post, he expressed his appreciation of the honor conferred.

Members of the Board of Directors said that "in view of the apparently more optimistic feeling in business circles of the country, Mr. Thomson believes there is an opportunity for him to render a service to the community through the Chamber of Commerce and believes it is his obligation and responsibility to do so."

Although the first meeting of the Board is not scheduled until October 13, Mr. Thomson is calling the members in special session at an early date to outline the fall and winter program.

It is not often that a busy executive will take "time out" to render a public service of this kind, business officials in Hamilton state, and they are pleased that Mr. Thomson has consented to take up the duties of the office for the benefit of the community at large. The board has chosen competent men as first and second vice presidents, treasurer and secretary to be associated with the paper manufacturer. Every effort will be made to advance the business interests of the city, one of the busiest manufacturing centers in the Miami Valley.

Bids for Government Paper

WASHINGTON, D. C., October 4, 1933—The Government Printing Office has received the following bids for 2,000 sheets of drab clothlined paper; Whitaker Paper Company, at $164.32 per M sheets; R. P. Andrews Paper Company, $194.00; Reese & Reese, Inc., $161.75; Barton, Duer & Koch Paper Company, $160.00; Lindemeyer Paper Company, $150.80 and $161.66; and Charles G. Stott & Company, Inc., $195.50.

Pacific Coast Pulp Mills to Merge

[FROM OUR REGULAR CORRESPONDENT]

SEATTLE, Wash., September 26, 1933—Announcement of plans for the merger of three Washington pulp companies with physical assets of more than $10,000,000, were announced in Seattle by Eugene Bashore of the San Francisco office of Blythe & Co., Inc. The companies affected are the Rainier Pulp and Paper Company of Shelton, the Soundview Pulp Company, Everett and the Olympic Forest Products Company of Port Angeles. This triumvirate of pulp interests provides for one of the largest independent units in the United States.

Officers of the three concerns have agreed to the terms of the proposed merger but final decision must await the decisions of the boards of directors and of the stockholders of the companies. The effective date for the consolidation is set for March 1, 1934.

"The contemplated form of the merger is the creation of a new company which would issue stock for the physical assets of the three pulp manufacturing firms," said Mr. Bashore. "Upon completion of the merger the new company would have assets representing an original investment of $15,000,000 which has a present depreciated value of $10,000,000. Also it would have net capital assets of more than $1,000,000 for operations. The total output of the new company will be in excess of 150,000 tons of pulp a year which is a trifle less than their combined capacity.

"The Rainier Pulp and Paper Company has specialized in the production of chemical pulp used primarily in the manufacture of rayon and cellophane and has developed world-wide markets for its output. It may be necessary as a measure of economy in operation to remove the machinery from Shelton to one of the other plants."

One of the principal reasons for discontinuing operations at Shelton is the opposition of the owners of oyster lands who have filed damage suits on the ground that the affluent from the pulp mill interferes with oyster culture.

Gardiner-Richardson Add Help

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, October 2, 1933—The Gardner-Richardson, of Middletown, will employ 305 additional men in its various departments and branches, including the Middletown and Lockland plants, under the Blue Eagle of the NRA. There are now 1345 employees in the two mills.

The Gardner-Richardson Company has operated its mills on the 40-hour schedule for all employees since August 1, increasing the hourly rates from 20 to 25 per cent, with a payroll increase of $260,000 annually.

The company is said to be the largest manufacturer of folding paper boxes in the world. The operations have been well maintained during the past few years in both the folding box and paper board departments.

Company officials announced today that the plants have been operating at full capacity recently and that they hope for a continued improvement in business.

F. C. Huyck & Sons Increase Help

ALBANY, N. Y., September 25, 1933—Announcement was made last week that F. C. Huyck & Sons has added about 236 new employees to its force and has increased its payroll to a large extent as a part of the Recovery Act program. The company has been doing everything possible to improve conditions by returning men to work and satisfactory results have already been obtained. Near capacity schedules have been in effect for some time and the company anticipates good conditions for some time to come.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Paper Specialties

Cable Insulation Paper for Electric Cables, Made from Wood Pulp and Manila Fibers. Kabelfabrik & Drahtindustrie Akt. Ges. Vienna. Aust. pat. 126,158 (Aug. 15, 1931).—The manila content of the paper is from 20 to 40 per cent.—J. F. O.

Process for the Preparation of a Substance for Impregnating Texture Materials, Paper, etc. for Rendering Them Water-proof. Johann Hackelberg, Hamm. Ger. pat. 561,507 (June 5, 1929).—Linseed oil is cooked for a short while with sodium chloride and beef tallow in the ratio of about 20: 4: 1. After slowly cooling, about 1.5 to 2.5 parts by weight of glycerin is added and also small quantities of boric acid or magnesia. The desired color can be added to the mixture.—J. F. O.

Process for the Improvement of the Printing Qualities of Paper. Robert Salzer, Vienna. Aust. pat. 128,876 (Feb. 15, 1932).—The printing quality of papers which have a tendency to flake or make dust can be improved by spraying a substance in liquid form onto the sheet.—J. F. O.

Mineral-Coated Paper. H. E. Potts assignee of Champion Coated Paper Co. Brit. pat. 379,833 (Aug. 10, 1931).—An aqueous composition containing clay, satin-white, etc., and an adhesive (casein, glue, etc.) is applied to the moving paper sheet and the excess is removed by suitable means (which are described).—A. P.-C.

Method of and Apparatus for Making Roofing Felt. Melvin R. Ware, assignor to Johns-Manville Corp. U. S. pat. 1,883,144 (Oct. 18, 1932).—This is an improvement on Ware's U. S. pat. 1,732,176, of Oct. 15, 1929. The sheet is formed on a cylinder around which is passed an endless wire belt. Inside the roll is a three-compartment suction box and several suction boxes are also provided under the wire after it leaves the roll, so as to remove sufficient water from the sheet to permit of eliminating all presses. The method is particularly suitable for the production of asbestos sheets intended to be impregnated with asphalt.—A. P.-C.

Coloring Crepe Paper. Edward H. Angier and Ernest R. Dearborn, Dearborn assignor to Angier. U. S. pat. 1,882,714 (Oct. 18, 1932). —Suitable coloring material (paints, pyroxylin lacquers, dyes, bronzes, etc.) is applied to one side of each of two webs of crepe paper, which are then led over and down between a pair of rolls so that the colored sides of the two webs come together at the bite of the rolls. The two webs are then separated and rewound separately.—A. P.-C.

The Materials Used in the Manufacture of Tracing Paper. Howard L. Vincent. Paper Trade J. 95, No. 26: 24-26 (Dec. 29, 1932). —A list is given of the more important materials used by foreign and domestic manufacturers of tracing paper, showing what characteristics may be expected of the several types of tracing paper prepared with them. A specification avoiding the present undesirable features of tracing papers is given.—A. P.-C.

Production of a Loosely Distended Mass of Fibrous Material in the Form of a Layer. F. B. Dehn, assignee of Cellufoam Corp. Brit. pat. 379,119 (Sept. 28, 1932).—Fibrous cellulosic material, mixed, if desired, with long hair-like fibers, is beaten with water together with a bubble-forming ingredient such as saponin. The distended mass is then formed into a uniform layer, subjected to suction at the surface to form a skin, and finally dried by heat without application of pressure.—A. P.-C.

Manufacture of Tracing Paper. F. W. J. Allott. Brit. pat. 379,575 (March 12, 1931).—By using a mixture of petroleum and resins (dammar, copal), optionally with addition of traces of vegetable oils (castor, poppyseed) as the "transparentising" agent, a paper is obtained which does not discolor or become brittle with age.—A. P.-C.

Manufacture of Tracing Paper and Transparent Paper. J. Knaggs, J. C. Marsden and Portals, Ltd. Brit. pat. 380,008 (March 30, 1932).—Paper made from cotton or flax is treated with an emulsion of oil, fat or wax with a protein (gelatin, albumin, etc.) and a hygroscopic substance (glycerin, magnesium chloride) and the protein is rendered insoluble by subsequent treatment with formaldehyde.—A. P.-C.

Production of Safety Papers. V. Bausch, Sr., T. Bausch and F. Bausch. Brit. pat. 378,694 (July 10, 1931). —Paper (of pH 3 to 5) containing acid-sensitive reagents, such as lead ferrocyanide and a ferric salt, is impregnated with a solution of a carboxylic acid derivative or benzene or naphthalene and (or) a derivative or compound thereof (*e.g.*, a 1:1 mixture of pyrogallolcarboxylic acid

and pentagalloylglucose) the pH of which has been adjusted to 3 to 3.5 by the addition of alkali. Such a paper reacts to acide and oxidising agents (including dilute potassium permanganate) giving stains difficult to remove with reducing agents.—A. P.-C.

Acoustical Board. William H. Mason, assignor to Masonite Corp. U. S. pat. 1,875,074 (Aug. 30, 1932).—An acoustical board is made up of strips of varying width secured together so that the strip edges form an irregular surface for the acoustical board.—A. P.-C.

Mounted Board. Kenneth L. Ozmun, assignor to Chicago Cardboard Co. U. S. pat. 1,884,174 (Oct. 25, 1932).—Two paper sheets, one having an outer printed surface, are applied to opposite faces of cardboard sheet coated on both sides with adhesive. The side and end edges of the printed sheet are overlapped beyond the edges of the other sheets so that the extending edges, which constitute the guide and gripper edges in printing, may also be used for feeding the combined sheets to the same guide edges to obtain accurate register with the printing for die cutting.—A. P.-C.

Glassine Paper. Kurt Bratring, assignor to Julius E. Kiefer. U. S. pat. 1,872,662 (Aug. 23, 1932).—A transparent paper is prepared by treating paper with a solution of 1 part of a light colored varnish gum such as copal, 3 parts of a solvent such as alcohol, and about 2 to 3 per cent of a softening agent such as castor oil. An apparatus is described.—A. P.-C.

Roofing. George P. Heppes, assignor to The Patent and Licensing Corp. U. S. pat. 1,873,886 (Aug. 23, 1932). —A waterproof foundation such as roofing felt is provided with an overlying layer of bituminous coating material and with a surface of fragments of felted fibrous material overlying the bituminous coating to give an irregular contour.—A. P.-C.

Composite Roofing Board. Otto A. Heppes, assignor to The Patent and Licensing Corp. U. S. pat. 1,873,887 (Aug. 23, 1932). —A cover board for asphaltic shingle bundles comprises a substantially rigid and waterproof slab composed essentially of a homogeneous mass of fiber and bitumen, a fibrous facing sheet adherently united to one face of the slab, and reinforcing elements affixed to the slab along opposite marginal edges.—A. P.-C.

Insulating Board. Clifford A. Watson. U. S. pat. 1,874,674 (Aug. 30, 1932). —A material suitable for use in building construction comprises a rigid slab of asphalt of cellular structure and substantial thickness (the asphalt having a melting-point of about 105 deg. C.) and at least one relatively thin sheet of material such as fiber board or felt secured to the asphalt layer.—A. P.-C.

Insulating Building Material. Charles A. Upson, assignor to The Upson Co. U. S. pat. 1,874,659 (Aug. 30, 1932). —A padded product for the insulation of the walls of buildings comprises an inner flocculent mass of fibrous material confined between liner sheets having relatively greater tensile strength. The longitudinal edges of the product are compressed throughout a substantial width to a greater degree than intermediate portions.—A. P.-C.

Process for Making Fibrous Insulating Products. Friedrich Grunder. U. S. pat. 1,876,221 (Sept. 6, 1932). —A mass of wood waste and other vegetable fibers, both of which have been treated in an alkaline liquor and have had the excess liquor removed, are comminuted, conveyed to a mold by means of a compressed air current whereby the mass is aerated. The mass is then lightly pressed to expel at least a portion of the moisture and is finally dried. —A. P.-C.

Wall Board. Leslie S. Odell, assignor to Building Products, Ltd. U. S. pat. 1,876,340 (Sept. 6, 1932). —A number of separate layers of fibrous material are adhesively united to form a comparatively thick insulating board. Each layer comprises a mass of fibrous material which is continuous throughout the length and width of the layer. A plaster-receiving surface for the board comprises an additional layer of fibrous material joined to an outer layer of the board by a comparatively thin layer of asphalt to serve as a barrier against the penetration of moisture from the additional layer.—A. P.-C.

Imprinting Paper Sheets Such as Plasterboard Facings. Ernest Gaskins, assignor to United States Gypsum Co. U. S. pat. 1,871,683 (Aug. 16, 1932). —Paper is printed with a dilute potassium permanganate solution, and dried by heat to produce a brown coloration of manganese dioxide which is not removed by dilute hydrochloride acid.—A. P.-C.

Waterproof Paper. Edward H. Angier. U. S. pat. 1,882,715 (Oct. 18, 1932). —Two sheets of paper are assembled with a regulated layer of fusible waterproofing material between them. The assembled sheet is heated to absorb the waterproofing material so that it penetrates only partly into the sheets. The latter are then separated and re-assembled with the faces formerly outermost opposed, and are joined by interposing water-resisting material which penetrates the rest of the sheets.—A. P.-C.

Process for Producing on Paper a Suede-Like Waterproof Finish. Andre Burnett. U. S. pat. 1,883,535 (Oct. 18, 1932). —One side of the paper is coated with adhesive; finely divided material is distributed over the coated surface, and the sheet is subjected to converging blasts of air and agitated.—A. P.-C.

Colored Crepe Paper. Gardner R. Alden, assignor to Dennison Manufacturing Co. U. S. pats. 1,871,647 and 1,871,769 (Aug. 16, 1932). —*No. 1,187,647*—For making non-bleeding colored crepe paper, a sheet of paper is treated with a fixing reagent such as aluminum sulphate followed by creping and application of a dye solution. *No. 1,876,769*—The paper is treated with a water-insoluble dye such as Victoria blue base dissolved in a substantially non-aqueous solvent such as alcohol and the solvent is then expelled to produce a non-bleeding colored paper.—A. P.-C.

Parchmentized Crepe Paper. Ernest L. Kallander and Robert F. Charles, assignors to Dennison Manufacturing Co. U. S. pat. 1,871,702 (Aug. 16, 1932). —A parchmentizing solution is applied to a web of paper and the web is then creped.—A. P.-C.

Method of and Apparatus for Forming Pulp Articles. Bertwell C. Root, assignor to Brown Co. U. S. pat. 1,882,937 (Oct. 18, 1932).—An aqueous suspension of long-fibered unbeaten wood pulp is flowed around and over a stationary screen mold. A substantial vacuum is maintained inside the mold until the deposit of pulp has attained the desired thickness. The excess of liquid pulp is drained, atmospheric pressure is restored inside the mold, the wet molded article is removed and dried.—A. P.-C.

Present State of the Technique of Viscose, Acetate and Gelatin Films and Similar Structures. M. Halama. Kolloid-Z 61, No. 2:240-246 (Nov. 1932); Bull. Inst. Paper Chem. 3:108-55. A decision of the present day manufacture of the above films, together with a comparison of properties and uses. An X-ray discussion is included, utilizing pictures of acetate and viscose films taken by Hess.—C. J. W.

Types of Corrugations Produced on Corrugated-Paper Machines. Papier-Ztg. 57, no. .102:1632 (Dec. 21, 1932). The author presents a general study of the manufacture of corrugated papers. The corrugations in

the papers may vary considerably but only two types have been found satisfactory from an economical point of view. Of these two, the triangular type has preference over the round-wave type due to the saving in material. The author also discusses the relationship of the corrugation depth on the length of the waves with respect to their effects on the properties of the paper. He cites the fact that American manufacturers have established a standard for this relationship whereas German manufacturers are not thus restricted.—C. J. W.

Fibre Boards. Their Uses and the Possibilities of Their Manufacture in Australia. R. F. Turnbull. Australia, Council for Scientific and Industrial Research, Division of Forest Products, Tech. Paper No. 6. 1932. 51 p. A study has been made of the possibilities of utilizing Australian hardwoods for making fiber boards and of the economic possibilities of the industry in Australia. A description is given of the various types of board in common use and a history of the growth of the industry is also included. A list of numerous uses for fiber boards and a discussion of their properties, are set out. A comparison is made of various types of board and of their properties. The plant scale experimental work with three species of eucalypt timbers, and the qualities of the boards made from them, are discussed. A plant suitable for Australia is described and estimates made of the probable cost of establishment and of cost of production in Australia. If by the establishment of a sufficiently large plant, production costs are kept low, the enterprise would warrant encouragement.—C. J. W.

Pulp Insulation for Telephone Cables. H. G. Walker and L. S. Ford, Bell System Tech. J. 12:1-21 (1933). A new type of insulated wire which is considerably cheaper than paper ribbon insulation has been developed. The insulation is formed from paper pulp directly on the conductor by a special type of paper making equipment. For purposes of durability, strength and economy a kraft wood pulp is used.—C. J. W.

Substitution of Brown Pulp for Unbleached Cellulose. M. Rabinov and V. Kondrat'ev. Bum. Prom. 11, No. 10:50-51 (1932); C. A. 27:596. Such a substitution is economically unprofitable.—C. J. W.

Revolving Screen for Ground Wood, Pulp and Similar Materials Consisting of a Mantel of One or More Parts. J. M. Voith, St. Polten. Aust. pat. 126-821 (Oct. 15, 1931).—J. F. O.

Influence of Stock Temperature and Hydrogen-Ion Concentration on a Kraft Paper Sized With a Special Starch*

By W. A. Chilson,[1] F. A. Simmonds,[2] P. K. Baird,[3] and C. E. Curran[4]

Abstract

A study was made of the effect on sheet properties of the addition of a special type of modified corn starch to a sized and unsized kraft furnish. The stock conditions were: pH values of 4.5, 5.5, 6.5 and temperatures of 65 and 75 deg. F.

The addition of the starch produced the following results:

1. The bursting strength was increased as much as 26 per cent due to the addition of starch at the optimum conditions of 5.5 pH and 75 deg. F. The minimum increase obtained was 12 per cent.

2. The tensile strength was increased about 14 per cent when the pH values were 4.5 and 5.5, and the temperatures were 65 and 75 deg. F.

3. The tearing strength was increased slightly when the stock pH was 4.5 and 5.5 and the temperatures were 65 and 75 deg. F.

4. The air transmission characteristics were not affected under any of the conditions maintained in the studies.

5. The water resistance was not changed under any conditions of the test.

Considerable variation has been experienced in the paper industry with the use of starch size. In some mills the addition of starch increases the strength of the paper made but in others the strength is decreased. This variation may be ascribed to several causes but the most probable appear to be either the temperature or hydrogen-ion concentration of the stock. The purpose of this article is to describe a series of paper machine runs made at the Forest Products Laboratory to determine the influence of stock temperature and hydrogen-ion concentration on sheet properties of a kraft paper sized with a special starch.

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Experimental Part

Materials

A total of 325 pounds of a Swedish kraft and 35 pounds of a southern pine pulp were used for the experiments. The starch used was a modified corn starch termed "special gum."[5] The rosin size and papermaker's alum were from stock supplies of standard materials.

The stuff used gave the following strength values when made into paper: Bursting strength approximately 0.72 points per pound per ream, tensile strength 5,500 meters breaking length, and a tearing strength of approximately 2.05 grams per pound per ream. Accordingly, the results obtained apply directly only to stuffs having the above characteristics and may or may not apply to stronger or weaker papers.

Apparatus

Two beaters were used: one of 50 pounds capacity for processing the pulp to stuff, and the other of 25 pounds capacity for mixing the size and alum with the stuff.

The 50-pound beater is equipped with a roll 24 inches in diameter, having an 18-inch face and weighing approximately 900 pounds. It has 52 bronze bars 5/16-inch wide in 13 clusters of 4 each. The bars in the clusters are spaced approximately 13/16-inch apart and the clusters are spaced 2 inches

[5] Supplied by Clinton Corn Syrup Refining Company, Clinton, Iowa.

apart. The roll rotates at 300 r. p. m., has a surface speed of 1,880 feet per minute and is adjusted by means of a hand wheel and lever system which moves it in the vertical direction 0.009 inch for each turn. The bed plate has 13 bronze bars ¼-inch wide spaced ¼-inch apart. The beater is equipped with a temperature recorder, a position recorder of roll settings, and a power meter.

The 25-pound beater has a roll 18 inches in diameter with a 14-inch face. The roll weighs approximately 400 pounds, has 30 bronze bars 5/16-inch wide spaced 1½ inches apart, rotates at 350 r. p. m. and has a peripheral speed of 1,650 feet per minute. The roll is raised and lowered by means of a hand wheel at approximately 0.001-inch for each turn. The bed plate has 10 bronze bars each 3/16-inch wide spaced ¼-inch apart.

A wet machine was used to reduce the moisture content of the stuff to about 71 per cent so that a relatively large quantity could be stored. This machine is of the standard type.

It is equipped with a cylinder 16 inches in diameter and 17 inches wide. The cylinder is faced with wire having 60 meshes per inch. The make-roll is brass and is equipped with a brass doctor so that the material (pulp or stuff) leaves the machine in a single web and not in lap form.

The paper machine screen is of the diaphragm type equipped with two standard-sized screen plates having 0.014-inch (14-cut) slots.

The paper machine is a fourdrinier type having a wire 15 inches wide and a forming table 7 feet long. A 65-mesh wire was used in these experiments. The deckles were adjusted to give a 12½-inch sheet on the wire and approximately a 12-inch sheet at the calenders. In addition the usual testing apparatus were used.

Procedure

Preparation of the Stuff

The Swedish pulp contained 11 per cent and the southern pine pulp 5 per cent moisture based on the oven method.

A total of 45 pounds of pulp (40½ pounds of Swedish kraft and 4½ pounds of pine kraft, calculated to the oven-dry basis) were soaked in water, then broken up by hand into small pieces and added to 17½ cubic feet of water in the 50-pound beater. The resulting consistence was 4.1 per cent. The pulp and water were circulated for 10 minutes; the roll was then lowered and the pulp was beaten for 3 hours according to the following schedule: 75 minutes at 0.8 of a turn off the bed plate (distance between knives of the roll and bed plate, 0.007-inch), 75 minutes at 0.5 of a turn (0.0045-inch), 15 minutes at 0.25 of a turn (0.002-inch), and 15 minutes at 0.15 of a turn off the bed plate (0.001-inch). The resulting stuff had a freeness of 390 cc. and the temperature rise during the beating was 30 deg. F., the range being from 70 to 100 deg. F.

Eight beater runs were made using the foregoing furnish and approximately the same beating schedule. In running the stuff over the wet machine two beater charges were thoroughly mixed in the stuff chest for approximately one-half hour and then pumped to the wet machine. The partly dewatered stuff delivered by the wet machine was sampled and placed in containers equipped with tightly fitting covers. Two containers were used for each batch, the second one being used after the first was filled. The contents of these were weighed at the end of each wet machine run and the weights together with a suitable identification mark were placed on tags attached to each of the containers. The moisture samples taken at definite intervals during each wet machine run were placed in one of two small containers which were kept tightly covered except when the samples were being added. The samples representing the contents of each large container were placed in separate small containers. At the end of each wet machine run the composite sample for each large container was divided and the two parts weighed, placed in a drying oven for 24 hours and then weighed again. Since preliminary tests indicated that the drying was completed in less than 24 hours, it was assumed that the samples were completely dry after 24 hours in the oven. The percentage weight of the stuff when oven-dry was calculated from the wet weight. This procedure was followed in each of the four wet machine runs. The total weight of stuff in each container was calculated on an oven-dry basis from the weight of wet stuff and its oven-dry content. These results are given in Table I. Due to wet machine losses and other losses incurred in getting the stuff to the wet machine, a total of 345 pounds of oven-dry stuff was obtained.

The equivalent of 20 pounds of oven-dry stuff was used for each paper machine run. Hence for each run approximately 5.8 per cent of the total wet contents was taken from each of the eight containers. In this manner approximately 17 beater charges of stuff were obtained which were alike as regards processing and properties. The quantities of the various stuffs used for each beater charge are shown in Table I.

TABLE I
WET MACHINE AND BEATER CHARGE DATA

Processing batch	Container	Wet machine			Composite beater charge	
		Wet weight	Moisture content	Oven-dry weight	Wet weight	Oven-dry
No.	No.	Pounds	Per cent	Pounds	Pounds	Pounds
1	1	143.75	29.0	41.7	8.29	2.40
	2	124.80	29.0	36.2	7.24	2.10
2	3	152.40	29.3	44.7	8.85	2.59
	4	156.40	29.4	46.0	9.08	2.67
3	5	162.40	29.4	47.8	9.43	2.77
	6	145.55	28.4	41.3	8.45	2.40
4	7	136.50	29.6	40.4	7.92	2.35
	8	156.00	30.0	46.8	9.06	2.72
				344.9		20.00*

* The quantity and composition of all beater charges were the same.

The 25-pound beater was used for disintegrating the stuff for each run and for mixing the stuff with the size and alum. The roll was raised 40 turns above the bed plate so that there was a clearance of approximately 0.04 inch between the bars of the roll and those of the bed plate. For each run the stuff was mixed with 9.2 cubic feet of water for 5 minutes and then 1½ per cent rosin size (calculated on the dry pulp basis) was added. This size was added as a 3 per cent emulsion and in each beater charge 10 pounds of the emulsion were used. The size and stuff were mixed for 5 minutes and then the alum was added. The alum was added in solution and its quantity was sufficient to give, after dilution with white water from the paper machine, the desired pH value for the stock and water at the paper machine head box. These quantities were as follows: 410 grams (0.90 pounds) for the pH of 6.5; 440 grams (0.97 pounds) for a pH of 5.5; and 710 grams (1.56 pounds) for a pH of 4.5. In the runs in which no rosin size was used the stuff was circulated in the beater for 10 minutes before the alum was added. The amount of alum necessary in these runs to obtain a pH of 6.5 at the head box was 325 grams or 0.72 pounds. After the addition of the alum the contents of the beater were mixed for an additional 10 minutes and then dropped to the chest.

In the machine runs made at the higher temperature the stuff in the beater was heated by steam to approximately 79 deg. F. before the size was added. This gave, after dilution in the chest, a temperature of approximately 72 deg. F.

In the runs in which starch was used, 2 per cent starch (182 grams) was added to the last part of the beater charge to be dropped. The starch was always mixed thoroughly with a small quantity of cold water to make a thick paste and then diluted to approximately 100 cc. before it was added to the stuff at the pipe line from the beater to the stuff chest.

The stuff was diluted with 11 cubic feet of water as it entered the chest, giving a resulting consistence of approximately 1.4 per cent. The stuff conditions in the beater and in the chest are shown in Table II. The stuff was agitated for 10 minutes and then was pumped to the stuff

TABLE II
STUFF CONDITIONS IN THE BEATER AND STUFF CHEST

Machine run No.	Beater run No.	Total weight stuff Pounds	Beater charge: Size Per cent	Alum Per cent	Starch Per cent	Temperature Degs. F.	H-ion concentration pH	Stuff chest: Consistence Per cent	Freeness Cc.	H-ion concentration pH
692	586	20.0	1.5	4.5	0	66	4.6	1.40	395	5.5
693	587	20.0	1.5	4.5	2	..	...	1.37	380	5.5
694	588	20.0	1.5	4.9	0	..	4.4	1.38	385	4.7
695	589	20.0	1.5	4.9	2	..	...	1.42	400	4.7
696	590	20.0	1.5	7.8	0	..	4.2	1.41	405	4.0
697	591	20.0	1.5	7.8	2	..	...	1.50	400	4.0
698	592	20.0	1.5	4.5	0	80	4.6	1.40	395	5.5
699	593	20.0	1.5	4.5	2	79	...	1.55	395	5.5
700	594	20.0	1.5	4.9	0	79	4.4	1.44	400	4.7
701	595	20.0	1.5	4.9	2	79	...	1.45	400	4.7
702	596	20.0	1.5	7.8	0	79	4.1	1.34	390	4.0
703	597	20.0	1.5	7.8	2	80	...	1.32	390	4.0
704	598	20.0	0.0	3.3	0	65	4.6	1.40	430	5.5
705	599	20.0	0.0	3.6	2	65	4.5	1.35	400	5.5

meter and the paper machine screen. During all runs no processing was done in the jordan.

Preparation of Fresh Water

Before each paper machine run was made, the white water system was filled with water having a pH the same or nearly the same as that desired at the head box. This water was made up in a tank to which a pump was attached for mixing purposes. Forty cubic feet of fresh water (pH 8.5) were used, the calculated amount of alum was added and, after thoroughly mixing, the hydrogen-ion value was determined and the water pumped to the machine. For a pH of 6.5, 260 grams of alum (0.57 pound) were added, for a pH of 5.5, 470 grams (1.04 pounds), and for a pH of 4.5, 770 grams (1.70 pounds).

Control of Machine Variables

At the head box the temperature was maintained as low as possible for one series and at approximately 75 deg. F. for the other series. No control was used at the low temperature and this temperature was approximately 65 deg. F. At the higher temperature, a temperature controller was used which admitted steam directly to the stock in the head box when the stock temperature was below 75 deg. F.

The white water system of the paper machine was repiped so that only the tray water was returned to the system. The white water was added to the stuff on the way to the machine from the stuff meter. In all runs the wire shower was used and allowances were made for the effect on the pH of the water carried to the system in the meshes of the wire.

The data on paper-making conditions is shown in Table III. In all runs the speed of the stuff and white water meters were maintained to give approximately 0.39 per cent consistence at the flow box and a sheet weighing approximately 50 pounds (24 x 36—500). The wire speed was held between 41½ and 42 feet per minute. A vacuum of 4½ inches on the first and second suction boxes and 3 inches on the third box was maintained during all the runs. The amplitude of the shake was ⅛-inch and the frequency was 240 complete strokes per minute for each of the paper machine runs. The pressure at the couch roll nip was held at 24 pounds per linear inch, and at the second press about 85 pounds per linear inch. The magnitude of the draw between the various sections was held as nearly constant as possible. Nine driers were used and the steam pressure on them was maintained between 5.2 and 5.4 pounds per square inch. The sheet was passed through all six nips of the calenders but no additional pressure was applied to the weight of the rolls.

Sampling

Samples were taken of the stuff in the chest, the stock leaving the paper machine screen, the white water in the tray, and of the paper at the reel. Four samples of about 150 cc. each were taken of the stuff about one minute apart after the stuff and water were thoroughly mixed as it overflowed from the stuff meter box. These were combined into one sample which was tested for consistence, hydrogen-ion concentration, and freeness. From the stock leaving the screen (which is the same as that in the head box) two sets of samples were taken at the end of each 5-minute period during each of the paper machine runs. One set (each sample 250 cc.) was taken and added to a 2-liter glass jar and tested for consistence only. For the other set, five 150-cc. beakers were used and each was marked for the time of sampling. In these cases each individual sample was kept in the sampling beaker and hydrogen-ion concentration tests were made on each sample. A series of 150 cc. samples was taken from the tray water at the same time that the head-box samples were taken and these samples were also kept in their individual sampling beakers for testing. These were also tested for hydrogen-ion concentration. At the end of each five minute interval a flag denoting the time was inserted between the layers of paper on the reel. For moisture determinations one sheet (9 by 12 inches) was taken near each of the flags at the end of each run. At the completion of all the runs ten representative sheets of full width (12-inch) and approximately 40 inches long were taken between the flags denoting the time when the proper operating conditions were being maintained. Each of the ten sheets was cut into four sheets (8 inches by $10\frac{3}{16}$ inches) and so piled that any ten consecutive sheets contained only one sample from an original sheet. From each set of samples ten consecutive sheets were taken and seasoned in an atmosphere at

TABLE III

PAPER MACHINE DATA

Machine run No.	Stuff meter R. p. m.	White water meter R. p. m.	Head Box: H-ion Conc. Consistence Per cent	Head Box: H-ion Conc. Av. pH	Head Box: H-ion Conc. Range pH	Head Box: Temperature Av. Deg. F.	Head Box: Temperature Range Deg. F.	Pond depth In.	Tray water pH ave.	Wire speed Ft./min.	Couch Lbs./sq. in.	Press Lbs./lin. in.	First Lbs./ sq. in.	Press Lbs./lin. in.	Second press Lbs./sq. in	Lbs./lin. in.	Steam pressure Lbs. sq. in.
692	22.0	39.5	.35	6.6	6.5-6.6	65.8	64.5-70.5	.35	6.8	42.0	12	24	30	79.4	30	84.4	5.25
693	22.0	39.5	.35	6.6	6.5-6.7	65.7	65.0-66.0	.35	6.8	42.0	12	24	30	79.4	30	84.4	5.30
694	22.0	39.5	.39	5.4	5.4-5.4	65.1	64.0-66.0	.39	6.2	42.0	12	24	32	83.6	31	86.5	5.30
695	22.5	40.5	.37	5.4	5.4-5.4	65.7	65.0-66.0	.40	6.2	42.0	12	24	31	81.5	32	88.6	5.30
696	22.5	40.5	.38	4.3	4.2-4.3	64.2	63.0-65.0	.37	4.3	42.0	12	24	30	79.4	30	84.4	5.40
697	22.5	40.5	.39	4.3	4.2-4.3	64.4	63.5-65.0	.35	4.3	42.0	12	24	30	79.4	30	84.4	5.30
698	22.5	40.5	.38	6.5	6.4-6.6	75.5	75.5-75.5	.38	6.8	42.0	12	24	30	79.4	30	84.4	5.40
699	23.0	41.5	.46	6.5	6.4-6.7	75.7	74.5-77.0	.38	6.7	42.0	12	24	30	79.4	30	84.4	5.40
700	22.5	40.5	.41	5.4	5.4-5.4	75.6	73.0-78.8	.38	6.1	42.0	12	24	29	77.3	29	82.3	5.30
701	22.5	40.5	.42	5.6	5.4-5.8	75.2	74.5-75.7	.38	6.1	42.0	12	24	30	79.4	32	88.6	5.30
702	22.5	40.5	.40	4.4	4.4-4.4	75.0	74.7-76.1	.37	4.5	42.0	12	24	31	81.5	31	86.5	5.40
703	22.5	40.5	.39	4.4	4.4-4.5	75.4	74.8-77.0	.38	4.5	42.0	12	24	30	79.4	30	84.4	5.30
704	22.0	39.5	.38	6.8	6.7-6.8	64.0	63.1-64.8	.36	7.0	41.5	12	24	30	79.4	30	84.4	5.40
705	22.0	39.5	.41	6.6	6.6-6.7	63.3	61.5-64.0	.36	6.9	42.0	12	24	30	79.4	30	84.4	5.40

* The following conditions were measured once and controls were not changed during the runs: Stuff depth in meter box 1½ inches; white water depth in meter box, 2½ inches; Shake frequency, 240 impulses per minute; Shake amplitude, ⅛ inch; Suction box vacuum: Number one, 4½ inches; Number two, 4½ inches; Number three, 3 inches; Nine dryers used; seven calender rolls; 0 air pressure at calenders; 41.3 pounds per linear inch top nip calender pressure; 52.1 pounds, second nip; 63.0 pounds, third nip; 73.8 pounds, fourth nip; 85.0 pounds, fifth nip; 100 pounds, sixth nip.

72 deg. F. and 65 per cent relative humidity for 48 hours and then tested for ream weight, thickness, solid fraction, bursting, tearing, and tensile strengths, air transmission (porosity) and resistance to water penetration. These were also tested for starch content.

Consistence tests were made as follows: A representative sample was taken and placed in a tared beaker, weighed and formed into a sheet on a fine felt placed on a wire mold. The sheet was then partly dried on a hot plate, then placed on a scale pan in an oven and dried to constant weight. The percentage of over-dry weight was determined from the original wet weight and the oven-dry weight.

The hydrogen-ion determinations were made using the LaMotte colorimetric standards.

The freeness tests were made using a tester of the Green type.

Temperature measurements of the stock in the flow box were taken at the five minute sampling intervals.

Ream weight tests were made in the usual manner using a basis weight scale and the entire sheet in each case. The average weight of the ten sample sheets was reported as the basis weight (24x36-500).

Thickness tests were made using a standard automatic micrometer having divisions indicating thickness to 0.0001 of an inch. Approximately 20 tests were made on each sheet at such locations that the average represented the thickness of the entire sheet.

Solid fraction values were calculated from the basis weight and thickness determinations and assuming a specific gravity of fiber substance of 1.50. The basis weight was divided by the weight of an equal volume of fiber substance. The following formula was used: basis weight in pounds multiplied by 0.0427; and, the product divided by the thickness in "points" (each point being 0.001 inch).

Bursting strength tests were made using an electrically driven Mullen tester. Two tests were made on each of the ten sheets at such locations that if only one sheet were used the tests would be made at different parts of the sheet equally distributed over the entire surface. The results of these tests were expressed as a strength-ratio, namely, the quotient of the average bursting strength in pounds per square inch divided by the average basis weight.

Tearing strength tests were made according to the standard method using the Elmendorf tester. Five tests were made on each of two folded strips taken from each of the ten samples. One strip was cut along the machine direction and one across the machine direction. The results in grams were divided by 2, because of the folded sample, and multiplied by the factor for the tester. The tearing strength was reported in grams per pound per ream (basis weight).

Tensile strength determinations were made using the Schopper tensile testing apparatus. Two sample strips 100 mm. long and 15 mm. wide were cut from each sheet in each principal direction.

Air transmission (porosity) was determined using the Gurley densometer. Two samples 70 mm. square were cut from each sheet, one was tested with the wire side down and the other with the felt side down.

The resistance to water penetration was determined by the dry indicator method. For these tests two representative samples each 2 inches square were cut from each sheet. Tests were made on each side of the sheet and the results were reported as the "size number." This number is the quotient of the time for penetration in seconds divided by the square of the thickness in "points."

The quantity of starch in the paper was determined using a slight modification of the official TAPPI method (T420m). Approximately 8 grams of oven-dry paper, weighed to 1 milligram, obtained by cutting narrow strips from different portions were used for each test. Since the factor for converting cubic centimeters of Fehling's solution to grams of starch varies with different kinds and grades of starch the exact factor for the starch had to be determined. For this determination a small sample of starch was dried at 100-105 deg. C. for three hours. From this 0.10 gram was weighed and boiled for 30 minutes with about 190 cc. of 4 per cent hydrochloric acid solution. This was neutralized with solid sodium carbonate, cooled and adjusted to 250 cc. Next, 25 cc. of Fehling's solution were added and the whole back titrated with standard dextrose solution.

With the samples which contained no starch a blank test was made so that the quantity would be known of any material in the paper which affected the starch determinations.

The results of the blank tests were subtracted from the values obtained in the starch determinations and the differences calculated on a percentage basis.

Discussion of Results

All of the results obtained from the paper machine runs are presented in Tables IV, V, VI and VII. Table IV contains a summary of all the data obtained on sheet properties under various operating conditions. Tables V and VI show the influence of the hydrogen-ion concentration and temperature respectively on the effects of starch on sheet properties. Table VII shows the effects of starch, with and without rosin size, on sheet properties.

Referring to Table IV, it may be noted that runs 692, 694, 696, 698, 700, 702 and 704 were made without starch and runs 693, 695, 697, 699, 701, 703 and 705 were made with starch. The addition of 2 per cent starch increased the bursting strength regardless of the stock pH or temperature in the ranges used but had practically no effect upon the porosity or water resistance properties of the

TABLE V

DATA SHOWING INFLUENCE OF HYDROGEN-ION CONCENTRATION ON EFFECTS OF STARCH ON SHEET PROPERTIES

Operating conditions				Sheet properties								
							Strength					
Machine run No.	Head box H-ion concentration pH	Starch added Per cent	Head box temperature Deg. F.	Basis weight (24x36-500) Pounds	Thickness Points	Solid fraction *	Moisture content of paper Per cent	Bursting Pts./lb./ream	Tearing Gms./lb./ream	Tensile breaking length Meters	Air transmission** Seconds	Water resistance***
693	6.6	2	65.7	52.3	4.86	.460	9.3	.87	2.06	5840	17.4	1.3
695	5.4	2	65.7	49.5	4.79	.440	7.2	.82	2.11	6035	14.1	1.3
697	4.3	2	64.4	50.9	4.87	.445	6.5	.80	2.10	5880	14.1	1.3
699	6.5	2	75.7	51.8	4.99	.445	7.0	.88	2.15	5640	14.5	1.3
701	5.6	2	75.2	51.9	4.97	.445	6.7	.82	2.22	6230	13.3	1.3
703	4.4	2	75.4	51.2	4.97	.440	7.3	.79	2.17	6005	12.8	1.3

* Weight of one volume of paper divided by the weight of one volume of solid fiber.
** Porosity (Gurley number) in seconds for 100 cc. air to pass through.
*** Seconds for penetration divided by the square of thickness.

TABLE VI

DATA SHOWING INFLUENCE OF TEMPERATURE ON EFFECTS OF STARCH ON SHEET PROPERTIES

Operating conditions				Sheet properties								
							Strength					
Machine run No.	Head box temperature Deg. F.	Starch added Per cent	Head box H-ion concentration pH	Basis weight (24x36-500) Pounds	Thickness Points	Solid fraction*	Moisture content of paper Per cent	Bursting Pts./lb./ream	Tearing Gms./lb./ream	Tensile breaking length Meters	Air transmission** Seconds	Water resistance***
693	65.7	2	6.6	52.3	4.86	.460	9.3	.87	2.06	5840	17.4	1.3
699	75.7	2	6.5	51.8	4.99	.445	7.0	.88	2.15	5640	14.5	1.3
695	65.7	2	5.4	49.5	4.79	.440	7.2	.82	2.11	6035	14.1	1.3
701	75.2	2	5.6	51.9	4.97	.445	6.7	.82	2.22	6230	13.3	1.3
697	64.4	2	4.3	50.9	4.87	.445	6.5	.80	2.10	5880	14.1	1.3
703	75.4	2	4.4	51.2	4.97	.440	7.3	.79	2.17	6005	12.8	1.3

* Weight of one volume of paper divided by the weight of one volume of solid fibre.
** Porosity (Gurley number) in seconds per 100 cc. air to pass through.
*** Seconds for penetration divided by the square of thickness.

TABLE IV

DATA ON THE EFFECT OF STARCH ON SHEET PROPERTIES UNDER VARIOUS OPERATING CONDITIONS

Operating conditions								Sheet properties						
Machine run No.	Starch added Per cent	Head box H-ion conc. pH	Head box temperature Deg. F.	Basis weight (24x36-500) Pounds	Thickness Points	Moisture content of paper Per cent	Starch content Per cent	Solid fraction *	Strength Bursting Pts./lb.	Strength Tearing Gms./lb.	Strength Tensile breaking length Meters	Air** transmission Seconds	Water*** resistance
692	0	6.6	65.8	50.8	4.77	10.0	....	.455	.78	2.18	5820	15.6	1.2
693	2	6.6	65.7	52.3	4.86	9.3	1.05	.460	.87	2.06	5840	17.4	1.3
694	0	5.4	65.1	50.2	4.68	12.5	....	.460	.73	2.04	5366	14.3	1.4
695	2	5.4	65.7	49.5	4.79	7.2	.91	.440	.82	2.11	6035	14.1	1.3
696	0	4.3	64.2	51.4	4.90	5.0	....	.450	.70	2.01	5160	14.2	1.3
697	2	4.3	64.4	50.9	4.87	6.5	.91	.445	.80	2.10	5880	14.1	1.3
698	0	6.5	75.5	49.5	4.78	6.0	....	.440	.75	2.10	5620	13.2	1.4
699	2	6.5	75.7	51.8	4.99	7.0	.70	.445	.88	2.15	5640	14.5	1.3
700	0	5.4	75.6	50.7	4.87	6.7	....	.445	.65	2.10	5320	13.2	1.2
701	2	5.6	75.2	51.9	4.97	6.7	.91	.445	.82	2.22	6230	13.3	1.3
702	0	4.4	75.0	51.6	4.93	6.3	....	.445	.70	2.01	5385	13.2	1.2
703	2	4.4	75.4	51.2	4.97	7.3	.70	.440	.79	2.17	6005	12.8	1.3
704	0	6.8	64.0	49.6	4.81	5.4	....	.440	.80	2.20	6150	11.6	0.0
705	2	6.6	63.3	50.7	4.91	4.8	1.05	.440	.92	2.20	6825	13.2	0.0

* Weight of one volume of paper divided by the weight of one volumne of solid fiber.
** Porosity (Gurley number) in seconds for 100 cc. air to pass through.
*** Seconds for penetration divided by the square of the thickness.

TABLE VII

DATA ON THE EFFECTS OF STARCH WITH AND WITHOUT ROSIN SIZE ON SHEET PROPERTIES

Operating conditions									Sheet properties				
									Strength				
Machine run No.	Starch added Per cent	Size added Per cent	Alum added Per cent	Head box H-ion concentration pH	Head box temperature Deg. F.	Basis weight (24x36-500) Pounds	Thickness Points	Solid fraction*	Moisture content of paper Per cent	Bursting Pts./lb./ream	Tearing Gms./lb./ream	Tensile breaking length Meters	Air transmission** Seconds	Water resistance***
704	0	0.0	3.3	6.8	64.0	49.6	4.81	.440	5.4	.80	2.20	6150	11.6	0.0
705	2	0.0	3.6	6.6	63.3	50.7	4.91	.440	4.8	.92	2.20	6825	13.2	0.0
692	0	1.5	4.5	6.6	65.8	50.8	4.77	.455	10.0	.78	2.18	5820	15.6	1.2
693	2	1.5	4.5	6.6	65.7	52.3	4.86	.460	9.3	.87	2.06	5840	17.4	1.3

* Weight of one volume paper divided by the weight of one volume of solid fiber.
** Porosity (Gurley number) in seconds for 100 cc. air to pass through.
*** Seconds for penetration divided by the square of the thickness.

sheets. The bursting strength was increased in all cases varying from 12 to 26 per cent. The tensile strength and tearing strength, on the other hand, were increased only when the pH was 4.4 and 5.4. Under these latter conditions the tensile strength was increased approximately 14 per cent at flow-box temperatures of 65 and 75 deg. F. At a pH of 6.5 and a temperature of 66 deg. F. (machine runs 692 and 693) the tearing strength appeared to be decreased about 5 per cent but under all the other conditions of pH and temperature, when rosin size was used, the tearing strength was increased from 2 to 8 per cent. When no rosin size was used as in machine runs 704 and 705 the addition of starch had no effect upon the tearing strength.

A variation was obtained in the retention of the starch under the different test conditions. At the lower temperature (65 deg. F.) and the highest pH (6.6) the retention was the highest obtained in the study. At the higher temperature (75 deg. F.) a low retention was obtained at pH values of 6.5 and 4.4.

Table V shows the influence of hydrogen-ion concentration on the effects of starch on the sheet properties. As regards the bursting strength starch appeared to be more effective at a pH of 6.6 than at either 5.4 or 4.3. Tensile strength, on the other hand, appeared to be little affected by hydrogen-ion concentration at 65 deg. F. At 75 deg. F. and a pH of 6.5 the tensile strength was lower than that obtained at either 5.6 or 4.4 pH. The sheet made at 6.5 pH appears to have the lowest air transmission (the longest time was required for 100 cc. of air to pass through the sheet). Water resistance was unaffected by hydrogen-ion concentration.

In Table VI are contained the results showing the influence of temperature on the effect of starch on sheet properties. The results indicate that temperature imposed no effect on the bursting strength and the water resistance. Increased temperature increased the tearing strength slightly at a pH of either 6.5, 5.5 or 4.4. It decreased the tensile slightly at 6.5 but increased it slightly at 5.5 and 4.4. Increased temperature also increased the porosity (decreased the Gurley number).

Table VII shows the effects of adding starch to stuff containing rosin size and to that containing no rosin size. Machine runs 704 and 705 contained no rosin size and machine runs 692 and 693 contained rosin size. If run 704 is compared with run 705, and run 692 with 693, it may be seen that the addition of starch increased the bursting strength and decreased the porosity (increased the Gurley number). The tearing strength was unaffected when no rosin size was used but was decreased slightly when rosin size was used. Tensile strength was increased when no rosin size was used but was decreased when rosin size was present. Comparing run 705 with run 693 starch seemed to affect the strength more when no rosin size was used. As may be seen from the data obtained from runs 704 and 705 starch did not render the paper water resistant.

Conclusion

The special starch sizing used in these experiments increased the bursting, tearing, and tensile strengths of kraft paper when the starch was added to the stuff entering the chest if the hydrogen-ion concentration value of the stock at the head box was either 4.4 or 5.5. At a hydrogen-ion concentration value of 6.5 only the bursting strength was increased. The addition of starch in the above manner had no effect upon the air transmission (porosity) or the water resistance.

Varying head box temperatures from 65 to 75 deg. F. did not affect the sizing or other qualities of the starch.

Forest Products Laboratory Research on Paper Machine Variables*

By Warren A. Chilson[1] and P. K. Baird[2]

Abstract

A brief outline of the study being made at the Forest Products Laboratory of the delineation and control of the variables inherent to the paper machine is presented.

Despite the wealth of empirical information possessed by experienced paper makers and by the manufacturers of paper machines, the extent of published information and quantitative data on the operating characteristics of paper machines is surprisingly small. Such meager records as can be found relative to the effects of operating variables and processing conditions on sheet properties are frequently contradictory and confusing. Even where definite studies have been made, it often appears that pertinent facts have been overlooked or omitted.

As one surveys the subject these circumstances are readily understandable. There is a veritable host of varia-

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bles that can and usually do enter into paper machine operation. Generally speaking, the particular stock at hand must be fitted to the paper machine, since the machine can only be roughly adjusted to the stock. The meaning behind the old saying that "paper is made in the beater" will continue to be true until more complete information is obtained on each machine variable, and the flexibility of the present papermaking equipment is extended.

The Forest Products Laboratory has for many years used a small experimental fourdrinier paper machine making a sheet 12 inches wide. While much good paper has been produced on this machine under the handling of an experienced practical papermaker, knowledge of the scientific factors affecting its operation has been very limited, and its main function up to about five years ago was mostly that of a mere pulp drier. For investigating the effect of machine variables on sheet properties it became essential that this "pulp drier" be converted into a precision apparatus. The following four lines of endeavor were therefore set up:

(1) The identification and relation of the independent and dependent variables of the paper machine.

(2) The development of methods and equipment for controlling all variables and for increasing the flexibility of the equipment.

(3) Studies of the effects of the variables on sheet properties; all independent variables except the one being studied to be maintained constant, dependent variables to be studied in groups.

(4) Design and manufacture of papers and paper boards of definite physical and chemical characteristics with engineering precision to meet the requirements of use.

Identification of Variables

The accomplishments to date are the identification of variables and development of a part of the operating controls and indicating and recording equipment for the experimental machine.

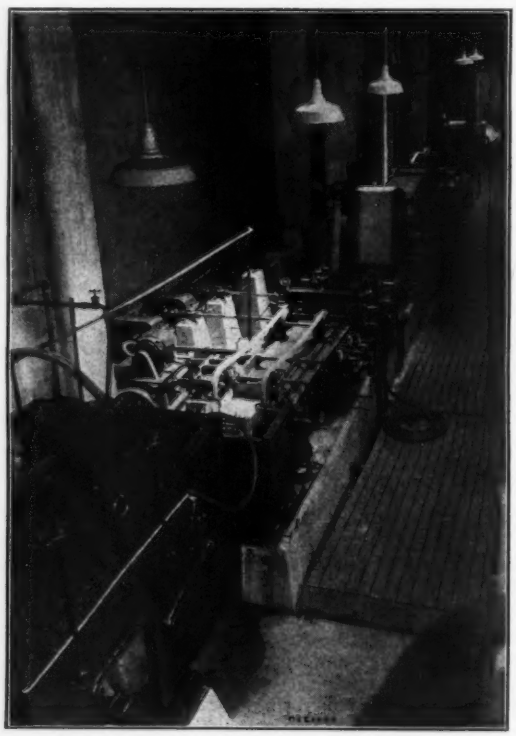

FIG. 1.

Fig. 1 is a view of this paper machine as it stands today in the Forest Products Laboratory at Madison, Wis.

Studies of the average commercial fourdrinier machine in operation, checked by the laboratory equipment, have resulted in the delineation and identification of over one hundred operating variables. The number of driers varies to such an extent that they are not included in the list but this variable can be indirectly evaluated through temperature gradient. Some of the variables are independent and some depend upon others. A thorough knowledge of the variables and their effects not only makes possible the scientific design of the sheet but can be applied in studies of the design of the paper machine itself.

A list of the variables already recognized follows:

Paper Machine Variables

Consistence of stock in pond
Temperature of stock in pond
Hydrogen-ion concentration in pond
Height of pond
Location of end of apron
Setting of slices
Location of slices
Number of slices
Mesh of fourdrinier wire
Surface speed of wire
Pitch of wire
Number of shake arms
Part of machine to which shake arm or arms are attached
Frequency of shake
Amplitude of shake
Number of table rolls
Diameter of table rolls
Location of table rolls
Table roll surface material
Surface speed of table rolls with respect to wire
Location of dandy roll
Diameter of dandy roll
Weight of dandy roll
Mesh of wire covering
Number of suction boxes
Location of suction boxes
Distance between suction boxes
Amount of vacuum on each box
Diameter of top couch roll
Angular setting of top roll with respect to bottom roll
Top couch roll material
Pressure applied at top couch roll
Covering material for suction roll
Diameter of suction roll
Pattern and shape and size of holes in suction roll
Amount of vacuum on suction roll
Difference in elevation between top of bottom couch and first felt roll determining angle at which web leaves the wire
Magnitude of draw between wire section and first press section
Covering material on top roll of first press
Diameter of top press roll
Covering material on bottom press roll
Diameter of bottom press roll
Pressure applied at first press
Weave and weight of first press felt
Covering material for bottom press suction roll
Pattern, shape, and size of holes in suction roll
Magnitude of draw between first and second press sections

The last nine variables also apply to the second and third presses.

Diameter of top roll in smoothing press
Covering material in top smoothing press roll
Diameter of bottom roll of smoothing press
Covering material in bottom roll of smoothing press
Pressure applied at smoothing press
Magnitude of draw between smoothing press and first drier section
Diameter of each drier
Temperature of each drier
Drier drainage system
Ventilation of driers
Drier roll design
Number of driers
Vertical distance between drier centers
Horizontal distance between drier centers
Number of rolls without drier felt
Drier felt material
Weave and weight of drier felt
Width of drier felt with respect to drier face
Tension of drier felt
Number of felt driers
Diameter of each felt drier
Temperature of each felt drier
Location of felt driers
Magnitude of draw between drier sections
Magnitude of draw between last drier and top calender roll
Number of calender rolls
Calender roll materials
Diameter of each roll
Temperature of each roll
Pressure gradient between rolls
Maximum pressure (roll weights plus lever pressure)
Slippage between rolls
Tension on sheet between calender and reel

In addition there are the variables of the size vat, breaker stack between driers, and a second calender stack of those machines so equipped.

Good examples of dependent variables are the consistence of the stock, the depth of the pond, the setting of the slices, and the speed of the stock going on the wire. These four variables are closely related, and a change in any one affects at least one of the other three. How much they affect the formation and consequently the sheet properties is not known in quantitative terms at the present time.

The temperature of the stock as it flows on the wire is an example of an independent variable. The importance of this factor is recognized by the fact that most mills are able to produce better paper during the winter because of the lower temperature of the water used. It is generally known that a reduction of stock temperature decreases the drainage rate on the wire, enhances the effect of the shake, and thus improves sheet formation; but no quantitative information is available on this variable nor is it known to what extent the temperature of the stock affects the porosity, strength, opacity and other properties of the sheet.

In the shake arrangement the variables are the frequency, the amplitude, the number of arms, and the parts of the wire section to which the arms are attached. Definite information will be obtained from a study of these factors as regards their effects on both sheet properties and wire life.

Table rolls not only support the wire but hasten the drainage of water from the stock. To obtain a thorough knowledge of the functions of table rolls consideration must be given their diameter, number, and spacing, as well as the surface speed of the rolls relative to that of the wire in case they are driven. From the data on sheets made during the study of each of the various table roll variables the proper arrangement will be determined for the rate of water removal desired for any given set of conditions.

The location and number of the suction boxes and cover openings have been somewhat standardized by paper machinery manufacturers. In some mills, however, it has been found necessary to relocate them or to add to their number. In others it has been necessary to reduce the number of flat boxes under the wire to meet their particular conditions. A study of the effect of these variables, together with the variable of suction applied on each box, will yield further valuable information.

Pressure applied at the various sections of the paper machine has received little attention except from the standpoint of water removal and sheet finish. Pressure applied to the wet sheet has been found to have a definite effect on certain sheet properties. Work at the Forest Products Laboratory on the relation of sheet properties to fiber properties in paper *(1)*, has shown that with increased pressure on the wet sheet, the apparent density, tensile and bursting strength, and folding endurance of the sheet are increased. The tearing strength increases with increased pressure in the low ranges, passes through a maximum, and then decreases at the higher pressure. This relationship was developed from observations made on test sheets pressed between the platens of a hydraulic press, but there is sufficient likeness in processing effect to indicate a similar result on the paper machine, although of smaller magnitude.

The effect of the materials used in the fabrication of top press rolls, especially those used in the first press section, upon sheet quality, has received considerable comment. It appears that unless a systematic study is made of the roll characteristics and roll pressure, together with stock and desired sheet properties, this question will remain unsettled.

One of the least understood yet most important variables is the draw between the various sections. In most mills the practice is to exert no more tension than is necessary to keep the sheet free from wrinkles. This, however, covers a wide range of draw values. In a machine having a part out of alignment which comes in contact with the sheet, the tension on the sheet would have to be more than that on a sheet running on a similar machine with all parts aligned. An idea of the effect of this variable may be obtained from results of preliminary tests in which a slight manipulation of the draw changed the porosity of a sheet as much as 100 per cent and the tensile strength as much as 30 per cent.

The drier part of the paper machine has recently been receiving much attention, and a considerable amount of experimental work on it has been done by the industry. If a survey were made, mills would be found making the same grades of papers using driers of various sizes, drier sections with and without drier felts, and sections using different felt materials. In order to obtain information of value on drying it is therefore necessary to study the effect of the number of driers, drier diameter, temperature, surface, spacing, drier felt material, felt tension, type, number and location of felt driers, arrangement of drier felt, and characteristics of the sheet entering and leaving the driers.

A number of variables are associated with the calenders. These are roll diameter, temperature, number of rolls, pressure gradient, maximum pressure, slippage between rolls, and the roll material. Under ordinary operation the calender pressure which is exerted to give a desired finish to a sheet is often sufficient to alter the bonds between fibers and weaken the sheet. When the effects of the variables of the calender section have been determined, a plan of calender processing could be worked out to give the most effective results for each weight and grade of sheet made.

The foregoing serve to illustrate some of the paper machine variables representing the various sections of a fourdrinier paper machine.

Methods and Equipment

It became evident quite early in the study that many changes in the experimental fourdrinier machine would be required to bring its operation up to the standard desired as reflected in sheet quality, and that for precision work it would need to be equipped with control and recording devices not in general use in paper mills.

Although the time and, particularly, the funds available for purchasing suitable instruments and equipment have been limited, definite progress has been made. In many instances where no standard control device was available, suitable apparatus has had to be designed and built. Where standard equipment was obtainable generous cooperation has been received from the manufacturers in providing and properly installing it for our special needs.

One of the most important operating conditions is the control of stuff to the wire. The stuff system at the Forest Products Laboratory is now under precise control and is equipped with indicating meters to check its operation. Adjustments can be made at a central control panel, and by means of flow charts and consistence and freeness data on the stuff it is possible to set the flow by an indicator so that the first paper over the machine will be of the desired weight.

The original stuff system at the Forest Products Laboratory consisted of the familiar regulating box having a constant head over an adjustable orifice. No trouble was experienced with slow stuffs, but the long fibers of free stuffs collected on the adjustable gate and variations in sheet weight resulted. This difficulty was overcome by the design and installation of a device which not only de-

livers a constant volume with constant stuff level but is easily controlled and its performance automatically recorded. This device consists of a multiple rotating dipper having six compartments, each of which takes stuff in at the periphery and discharges it at the center (Fig. 2). The dipper is driven by a motor with adjustable-speed so that the quantity of stuff delivered can be controlled from a remote point.

In the Forest Products Laboratory flow system the stuff pump delivers the stuff to the stuff box, which is equipped with a fixed overflow gate. The dipper rotates in this box and discharges the measured stuff either to the jordan or to the discharge line of the jordan, where it is mixed with the desired quantities of white water and delivered to the machine screen.

The white-water system also uses a multicompartment dipper similar to the one used in the stuff system. The white-water box has two main compartments, one supplying the white-water pump and the other receiving the tray water and flat-box water. The compartment supplying the pump discharges into a line having a valve controlled by a float in the compartment. This valve maintains a flow to the pump equal to that delivered by the dipper. The other main compartment has a series of baffles, an overflow dam, and a float-controlled fresh water line that maintains a constant water level in the box. The baffles are so arranged that the tray water rich in fibers is taken first, then the suction box water, after which fresh water is added if any is required. At the present time the quantities of stuff and white water, the two raw materials for the paper machine, are under definite control and are instantly adjustable at a central control panel.

The paper machine flow box has adjustable baffles to permit thorough and uniform mixing of the stock and water as they pass to the wire. It is equipped with a recording temperature-controller which keeps the stock at a constant temperature above that of the fresh water. The pond is equipped with a stock level recorder.

All parts of the machine where pressure is applied are equipped with adjustable pneumatic pressure cylinders. These were chosen because they are flexible, they can readily be connected to recorders and can be used either as tension or compression members to add to the pressure exerted by the weight of roll or to offset the pressure due to roll weight. The top couch, top press rolls, and calenders (the latter operating only by tension) are all equipped with the pressure cylinders and with recording instruments which give complete operating information on the pressure applied to the web and sheet at the various points.

Recorders are also supplied with the suction boxes to give the vacuum at each box throughout the running period.

One of the interesting laboratory developments is the drawmeter, a device which indicates the difference in speed between any two sections. This variable is particularly

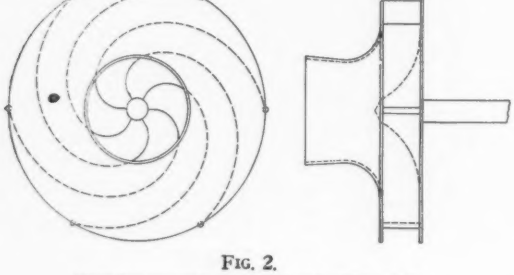

FIG. 2.
Metering apparatus for stuff and white water.

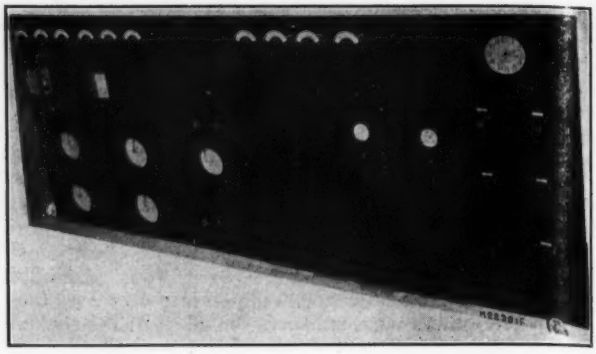

FIG. 3.

difficult to measure in a slow-speed machine. Both mechanical and electrical units were conceived, built, and installed on the paper machine. The electrical unit proved more satisfactory and has since been developed to be applicable to felt and wire speeds as well as roll surface speeds. In the wire and press sections small rolls driven by the wire and felts drive the electrical units. The top calender roll drives one unit, and the drier drive shaft drives another. By using this set-up indications and records can be obtained of the difference in surface speed between the wire and the first felt, between felts, between felt and drier rolls and between rolls of any paper machine section.

An electrical system based on the difference in current flow delivered by two magnetos is used for indicating the draw. A speed-up unit driving two magnetos is attached by couplings to a roll journal or drive shaft in each section of the machine except the first and last sections, in these sections a speed-up unit driving one magneto is used. One magneto is connected in a circuit with a magneto in the preceding section and the other in a circuit with a magneto in the following section. The difference in current flow or voltage is indicated and recorded on a suitable meter on the control panels.

The units are so designed that they can be readily adapted to the sections of commercial paper machines, enabling machine operators to watch and obtain records of the draw at any time the machine is running.

In Fig. 3 is shown the Forest Products Laboratory's special operating panel, which covers the variables thus far brought under control. In each run a set of charts can be produced which are filed with the data and samples, thus permitting duplication of the processing conditions whenever desired.

Although in its present state, this study concerns only the delineation and control of variables on an experimental paper making machine, the investigation of the studies planned should result in much valuable information to papermakers generally and will be of ultimate service to the operators of all types and kinds of paper machine equipment. Ultimately it may prove possible to have all the essential processing conditions recorded on a wide strip chart showing simultaneously operations of the machine and the properties of the sheet being produced. It would then be an easy matter for the superintendent to analyze and control the processes and products when such a chart record of each shift is torn off and laid on his desk regularly. Such a record would greatly lighten the burden of the faithful and diligent superintendent.

Literature Cited

(1) R. H. Doughty, Paper Trade J. 93, no. 2:39-44 (July 9, 1931); 93, no. 15:44-49, 54 (Oct. 8, 1931); 94, no. 9:29-34 (March 3, 1932); 95, no. 10:31-38 (Sept. 8, 1932).

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Fernandina, Fla.—The National Wood Fibre Growers' Association, Fernandina, care of W. L. Wilson, Barnett Bank Building, Jacksonville, Fla., secretary-treasurer, recently organized, is planning construction of new fiber products mill at Fernandina, consisting of several units for wood fiber and pulp service, power house, docks and other miscellaneous structures. Entire project will cost over $5,000,000. Application has been made for Federal loan to finance the development.

Brooklyn, N. Y.—The Atlas Corrugated Case Company, 3 Corlears street, New York, manufacturer of corrugated cases and containers, has recently leased two floors in the industrial building at 488 Morgan avenue, Brooklyn, and will occupy for new plant.

Appleton, Wis.—The Fox River Paper Company, South Appleton street, is said to be considering early rebuilding of two plant structures used for storage and distributing service, recently damaged by fire. An official estimate of loss has not been announced.

New York, N. Y.—The Roche Envelope and Carton Corporation, recently organized with capital of $10,000, plans operation of local paper converting plant for the manufacture of commercial envelopes, boxes, containers, etc. New company is represented by John G. Turnbull, 111 John street, New York.

Adams, Mass.—The Brightwater Paper Company, recently organized to take over and operate the local mill of the Eaton Paper Company, Inc., previously noted in these columns, has taken out a charter under Delaware laws, with capital of 12,000 shares of stock, no par value. New company will manufacture fine writing papers and kindred paper stocks. Stuart W. Webb is president; and George W. Verow, vice-president.

Emeryville, Cal.—The California Container Company, lately organized, has awarded general contract to P. M. Sanford, 301 Alta Punta avenue, Richmond, Cal., for extensions and improvements in former local plant of the Rheem Manufacturing Company, 4535 Horton street, which has been secured under lease. The structure will provide about 75,000 square feet of floor space and will be equipped at early date for the manufacture of paper and paperboard boxes and containers. Entire project will cost close to $100,000, with machinery. C. J. Munes is president of new company, and G. A. Vollmer, vice-president.

Phillips, Wis.—The Wisconsin Wood Products Corporation, Rib Lake, Wis., Victor Gustafson, head, has begun construction of a new one-story plant unit at Phillips, to be used as a fiber mill. It will be 42x80 feet, reported to cost about $20,000, with equipment. Pulp grinding and other machinery will be installed.

Dexter, N. Y.—The Warren Parchment Corporation has been organized under State laws, with capital of 100 shares of stock, no par value, to take over former local mill of the Ron-Noc-O Paper Corporation, which succeeded to the Warren Parchment Company some time ago. The new organization will be affiliated with the Centauer Paper Products Corporation, Brooklyn, N. Y., which recently took over the local mill, and will specialize in the production of parchment and kindred paper stocks.

Peshtigo, Wis.—The Badger Paper Mills have work nearing completion on a new addition to plant, one-story, 24x118 feet, and will use for expansion in finishing department. It is proposed to have the unit ready for service at early date. C. R. Meyer & Sons Company, 50 State street, Oshkosh, Wis., is general contractor.

Irvington, N. J.—The Tuffibre Company, 156-62 Coit street, manufacturer of fiber products, has leased space in building on Sylvan avenue, Newark, N. J., formerly occupied by the Continental Rubber Company, totaling about 10,000 square feet of floor space and will occupy for new plant. Company factory at Irvington, address noted, was recently destroyed by fire and will not be rebuilt at this time. New equipment will be installed in the leased property.

South Haven, Mich.—The South Haven Terminal Company is planning early construction of a new warehouse building, to be one-story, 200x235 feet, designed and equipped for handling wood pulp shipments for distribution to different paper mills in this district. New unit is reported to cost over $50,000, with equipment.

Fitchburg, Mass.—The Crocker, Burbank & Co. Association is completing construction of a large dam, to be known as the Brooks Dam, for increased water supply at local paper mill. A reservoir comprising about 106 acres of land has been built and will be filled with water from the Nashua River Dam and Blue Dam, both at South Ashburnham.

Port Hardy, B. C.—The Port Hardy Pulp and Paper Company, Ltd., has plans nearing completion for construction of a new wood pulp distillation and chemical works, consisting of several units, reported to cost over $200,000, with machinery. Bids will soon be asked on general contract.

Montreal, Que.—The Consolidated Paper Corporation, Ltd., Montreal, is arranging to cut about 70,000 cords of pulp wood during the winter, for use at its different mills. The mill at Port Alfred, Que., is scheduled to be placed in service early in the coming spring, with other plants continuing on present basis.

New Westminster, B. C.—The Westminster Paper Company, Ltd., has approved plans for construction of new one-story power house at local mill on Sixteenth street. It will be one-story, 38x74 feet, comprising boiler and

engine departments, estimated to cost about $50,000, with equipment. General contract for building has been awarded to the Dominion Construction Company, Ltd., Vancouver, B. C.

New Companies

Schenectady, N. Y.—The Beck Paper Corporation has been organized with capital of 100 shares of stock, no par value, to manufacture and deal in paper products. New company is headed by Philip J. Beck, 246 McClellan street, and William E. John, 324 Crane street, both Schenectady.

Brooklyn, N. Y.—The Seethru Specialties Corporation has been incorporated with capital of $13,000, to manufacture paper bags and containers. New company is represented by Henry Simon, 401 Broadway, New York, attorney.

Saginaw, Mich.—The Northern Paper Box Company, 320 South Hamilton street, has been incorporated with capital of $15,000, to manufacture paper boxes and containers. Lester M. Hoch is principal incorporator and representative.

Spring Valley, N. Y.—The Manlo Bag and Paper Company, Inc., has been organized with capital of $5,000, to manufacture and deal in paper bags, containers, and other paper goods. The incorporators include Meyer Manis and Benjamin Vlosky, both of Spring Valley.

Brooklyn, N. Y.—The Premier Bag Company, Inc., has been organized with capital of 200 shares of stock, no par value, to manufacture and deal in paper bags and kindred paper products. The incorporators include Aaron W. Einhorn, 160 Forty-second street, Brooklyn, and Sidney Einhorn, 199 Main street, White Plains, N. Y.

Buffalo, N. Y.—The Central Waste Paper Company has filed notice of organization to deal in waste paper, etc., William J. Reddington, 59 East Market street, heads the company.

Paper Firms Pledging Stream Purification

INDIANAPOLIS, Ind., October 2, 1933—Cooperation of the Ball Brothers Company of Muncie, which recently acquired the Eaton strawboard plant at Eaton, Ind., with the Indiana department of conservation in cleaning up unsatisfactory conditions along the Mississinewa river, has been pledged by William H. Ball, secretary of the company. The plant is one of several industries along the river which have contributed to the pollution, it was said by W. H. Frazier, sanitary engineer of the state department.

Within a few days the department will confer with operators of the Fort Wayne Corrugated Paper Company plant at Hartford City, Ind., with the expectation that the same co-operation will be received from that firm.

The pledge of co-operation from the Ball Brothers Company is the second that has been received by the department from large manufacturing firms during the week.

Postpone Rates on Rags and Waste Paper

As a result of an appeal filed by Charles J. Browne, managing director of the American Paper Mill Supplies Institute, the Eastern Lines postponed the effective date of the new rates on scrap or waste paper, rags, etc., in Official Classification territory, from November 1, 1933 to January 1, 1934.

The extension was granted to enable the Traffic Executive Committee to act on the Institute's appeal and allow ample time for the compilation of necessary data to support Mr. Browne's contention that the recommended bases are too high and will do the carriers more harm than good.

Paper Trade Code of the World

The Atlas Paper United Telegraph Code, just off the press, fulfils a long felt want of the world paper trade.

Every conceivable technical detail, term and phrase has been included requiring the use of more than 200,000 5-letter Codewords, and 1050 pages, size 9½ x 12½ inches.

Heretofore, the inclusion of such a vast amount of data was not possible, but due to the new International Telegraph Regulations effective January, 1934, the scope of 5-letter Codes has been greatly increased with a decided advantage in favor of the cabling public when properly utilized.

Some of the outstanding features of the Atlas Code include; sizes in centimeters and inches covering single dimensions, two dimensions, and a combination table of two dimensions with weight of the paper. This permits the coding of the size: "KSULT, 70 x 90 centimeters, 88 grams per square meter." Similar tables have been arranged also for sizes in inches.

Technical matters relating to the making of paper have been exhaustively covered. For example; the codeword, "KDVKA" means "Coating comes away from the paper."

A very ingenious table requiring the use of 1200 5-letter codewords on pages 844 and 845 by which any 60 standard colors can be combined with 20 kinds of finish. For example: the codeword, "KWUB" means "Ivory white color, fabric finish." More than 250 names of colors are listed on page 846. Phrases relating to color are quite important in the paper trade and this code has covered it extensively in 8 pages.

Cores require the use of 4 pages and one may use the codeword "LIZMK" meaning "Strawboard cores, plugs with center opening of 3 inches, diameter of rolls 30 inches." Centimeters dimensions are also available under the same system.

Practically every kind of paper is listed from pages 898 to 907 beginning with abrasive paper to writing paper.

Packing in bales, bundles, cases, etc., has been given thorough study as evidenced by the large number of codewords allotted to this subject.

It is fair to assume that The Atlas Paper United Telegraph Code will not only effect a tremendous saving in telegraph expenses but will enable one to more clearly express himself in code.

The time taken to compile and print this Code was more than four years and required the records of more than 100 prominent firms, covering their private codes, sent and received cables, correspondence, orders and other vital records.

The results seem to have been fully justified as it appears that the Code is everything desirable by those requiring its use.

The publishers, the Central Code Bureau, 76 Broad street, New York, offer to submit this Code to any firm interested for examination and approval without obligation.

George Paper Bag Factory Expands

WELLSBURG, W. Va., September 25, 1933—Ground has been broken at the S. George company paper bag factory at Twelfth street, Wellsburg, for an addition to be built to the factory. The new building, 110 by 153 feet, will be erected of brick, concrete and steel.

The contract was let to the Austin company of Cleveland, Ohio. It is estimated to cost $40,000. Between 30 and 40 men will be employed on this job during the next three months.

TECHNICAL ASSOCIATION MEETS AT APPLETON

(Continued from page 18)

Brabender, Marathon Paper Mills Co.; G. S. Brazeau, Weyerhaeuser Timber Co.; Russel Brenzel, Thilmany Pulp and Paper Co.; G. S. Brickett, Congoleum-Nairn, Inc.; Arthur M. Brooks, Raffold Process Corp.; W. E. Buchanan, Appleton Wire Works, Inc.

O. W. Callighan, Edgar Brothers Co.; Harvey P. Cannon, Container Corp. of America; Mrs. Harvey P. Cannon, Germantown, Philadelphia, Pa.; J. L. Carey, Chicago, Ill.; G. C. Carroll, Combined Locks Paper Co.; F. Casciani, Electro Bleaching Gas Co.; Chas. Cassell; D. S. Chamberlin, National Oil Products Co.; C. H. Champion, R. T. Vanderbilt; M. P. Chaplin, Keys Fibre Co., Inc.; Mrs. M. P. Chaplin, Waterville, Maine; R. C. Charron, U. S. Envelope Co.; Andreas Christensen, Rhinelander Paper Co.; W. C. Christensen, Hoberg Paper & Fibre Co.; Frederic C. Clark, Skinner & Sherman, Inc.; James B. Clarke, National Aniline & Chemical Co.; Mrs. James B. Clarke, Chicago, Ill.; James d'A. Clark, Scott Paper Co.; Mrs. W. L. Clements, Kalamazoo, Mich.; Miss R. M. Cobb, Lowe Paper Co.; Arthur A. Coffin, Titanium Pigment Co.; Grellet N. Collins, International Paper Co.; C. M. Connor, Valley Forge Laboratory; J. M. Conway, Hoberg Paper and Fibre Co.; N. C. Cooper, E. I. Du Pont de Nemours & Co.; R. C. Crain, Institute of Paper Chemistry; J. J. Craven, National Oil Products Co.; C. E. Curran, Forest Products Laboratory; H. M. Cyr, New Jersey Zinc Co.

Mrs. F. H. Dauchert; J. H. Davidson, Minnesota and Ontario Paper Co.; Roy L. Davis, Consolidated Water Power and Paper Co.; David DeZurik, DeZurik Shower Co.; G. K. Dickerman, Consolidated Water Power and Paper Co.; L. S. Dixon, Bangor, Maine; R. H. Doughty, Forest Products Laboratory; A. C. Dreshfield, Paper Makers Chemical Corp.; M. L. Downs, Institute of Paper Chemistry; John R. Dufford, Paterson Parchment Paper Co.

Vance P. Edwardes, International Paper Co.; Frank W. Egan, J. O. Ross Engineering Corp.; Roger J. Egan, Bulkley Dunton Co.; Frank B. Eilers, Orr Felt and Blanket Co., Eastwood Nealley Corp., Fitchburg Duck Mills; I. Ekholm, National Aniline and Chemical Co.; Sigge Ekman, Rhinelander Paper Co.; R. Elias, Institute of Paper Chemistry; L. E. Emerich, Leeds & Northrup Co.; G. F. Enderlein, Mosinee Paper Mills Co.; V. R. Ewing, Solvay Sales Corp.; J. A. Extrom, Tomahawk Kraft Paper Co.; Mrs. J. A. Extrom, Tomahawk, Wis.

H. S. Falk, Falk Corp.; William A. Fannon, The Fannon Trading Co.; J. R. Fanselow, Kimberly-Clark Corp.; J. Fish, Paterson Parchment Paper Co.; Myron F. Flotow, French Paper Co.; Norman H. Foley, Marathon Paper Mills, Menasha; Nelson L. Fortin, Revere Copper and Brass Co., Inc.; James A. Foxgrover, Paper Makers Chemical Corp.; O. W. Frost.

A. T. Gardner, Combined Locks Paper Co.; L. Gilberton, Institute Paper Chemistry; T. M. Gillespie, Pennsylvania Salt Mfg. Co.; Mrs. T. M. Gillespie, Chicago, Ill.; J. E. Goodwillie, Beloit Iron Works; W. H. Graebner, Marathon Paper Mills (Menasha); Roger C. Griffin, Arthur D. Little, Inc.; L. L. Griffiths, Jr., Heller & Merz Corp.; J. W. Grimes, Standard Oil Company of Indiana.

A. B. Hansen, Marinette & Menominee Paper Co.; Ward Harrison, Institute of Paper Chemistry; R. S. Hatch, Weyerhaeuser Timber Co.; A. B. Hauser, Marinette and Menominee Paper Co.; W. M. Hayes, Rhinelander Paper Co.; Ralph A. Hayward, Kalamazoo Vegetable Parchment Co.; Mrs. R. A. Hayward, Parchment, Mich.; Gerald Haywood, West Virginia Pulp and Paper Co.; Herb Heilig, Appleton Vocational School; C. C. Heritage, Oxford Paper Co.; Mrs. C. C. Heritage, Rumford, Maine; G. A. Hermann, Hermann Mfg. Co.; E. C. Hilfert, Riverside Paper Corp.; Mrs. E. C. Hilfert; G. K. Hill, Gilbert Paper Co.; Raymond P. Hill, Pulp Bleaching Corp.; W. O. Hisey, P. H. Glatfelter Co.; W. F. Hoffman, Northwest Paper Co.; Herbert Holbrook, Wadhams Oil Co.; Roger Wolcott Hooker, Hooker Electrochemical Co.; Guy C. Howard, Marathon Paper Mills Co.; Charles M. Howell, Scott Paper Co.

J. H. Jackson, The W. S. Tyler Co.; E. C. Jacobi, Standard Oil Co.; Mrs. E. C. Jacobi, Green Bay, Wis.; Carl H. Johnson, Northern Paper Mills; F. Hayward Johnson, Jr., Chemi Pulp Process; Mrs. F. H. Johnson, Jr., Wisconsin Rapids, Wis.; S. B. Jones, West Virginia Pulp and Paper Co.

B. L. Kassing, Hammermill Paper Co.; Walter Kasten, First National Bank of Milwaukee; W. S. Kidd, E. B. Eddy Co.; R. J. Kieckhefer, American Lace Paper Co.; Helen U. Kiely, American Writing Paper Co.; J. C. Kimberly, Neenah, Wis.; Jack Kimberly, Kimberly-Clark Corp.; Kenneth King, E. I. Du Pont de Nemours & Co.; F. H. Knowlton, Staley Sales Corp.; Paul Koenig, P. H. Glatfelter Co.; Otto Kress, Institute of Paper Chemistry; M. A. Krimmel, Hammermill Paper Co.; Stephen I. Kukolich, Neenah Paper Co.

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Roy I. Nilsen, Northwest Paper Co.; W. A. Nivling, The Huron Milling Co.; C. H. Noble, Mrs. C. H. Noble,

Kalamazoo, Mich.; H. G. Noyes, Wisconsin Vocational Schools, Appleton; John J. Nylund, General Dyestuff Corp.

Henry E. Obermanns, Institute of Paper Chemistry (Student); J. J. O'Connor, Mead Corporation; Mrs. J. J. O'Connor, Chillicothe, Ohio; Aug. C. Orthmann, The Orthmann Laboratories, Inc.

P. A. Paulson, Appleton; L. B. Penhallow, Wadhams Oil Co.; David F. Peterson, Bergstrom Paper Co.; E. A. Peterson, Valley Iron Works; R. A. Peterson, Valley Iron Works; Herbert Philipp, Solvay Process; N. E. Philpot, Duriron Co., Inc.; A. G. Pounsford, Provincial Paper, Ltd., Port Arthur, Ont.; W. C. Prebbanow, Consolidated Water Power and Paper Co.; Charles J. Prescott, Jr., Bennett, Inc.; R. P. Price, Hammermill Paper Co.

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C. E. Saecker, Appleton Machine Co.; W. L. Savell, Mathieson Alkali Works, Inc.; William H. Schlafge, Minnesota & Ontario Paper Co.; Hugo Schlenk, Jr., Northwest Paper Co.; J. Carl Schmidt, E. I. Du Pont de Nemours & Co.; Mrs. J. Carl Schmidt, Collingswood, New Jersey; H. C. Schwalbe, Dill & Collins, Inc.; G. L. Schwartz, E. I. Du Pont de Nemours & Co.; S. F. Shattuck, Kimberly-Clark Corp.; D. C. Shepard, Menasha Wooden Ware Co.; O. R. Shuey, Cumberland, Maryland; J. F. Shuman, American Cyanamid and Chemical Co.; Harold Sinclair, Bennett, Inc.; C. B. Smith, The Huron Milling Co.; Mowry Smith, Menasha Wooden Ware Co.; Ralph M. Snell, Hurlbut Paper Co.; A. L. Spafford, Northwest Paper Co.; Harry G. Specht, Eastwood-Nealley Corp.; Mrs. H. T. Spyker, Wausau, Wisconsin; S. A. Staege, Westinghouse Electric and Manufacturing Co.; J. A. Staidl, Thilmany Pulp and Paper Co.; K. E. Stansbury, Thilmany Pulp and Paper Co.; F. A. Steele, New Jersey Zinc Co.; Westbrook Steele; Mrs. Westbrook Steele; F. H. Scott, Westinghouse Electric and Manufacturing Co.; N. S. Stone, Mosinee Paper Mills; John Strange, Institute of Paper Chemistry; J. P. Strasser, Stein, Hall Manufacturing Co.; Miss E. Stroschneider, Institute of Paper Chemistry; E. Sutermeister, S. D. Warren Co.; W. H. Swanson, Kimberly-Clark Corp.

C. R. Tait, Hammermill Paper Co.; M. J. Taylor, Hudson Sharp Machine Co.; C. K. Textor, Northwest Paper Co.; A. H. Thuerer, Appleton Woolen Mills; F. J. Timmerman, Northern Paper Mills; John Traquair, Mead Corporation; J. A. Turner, E. I. Du Pont de Nemours & Co.

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Indianapolis Paper Demand Unchanged

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., October 2, 1933—Little change is seen in paper demand here during the last week. Business is hardly as brisk as it started with the opening of the fall season, but there is some buying and prices seem fairly well stabilized. With the coming of cooler weather, summer specialties have been lagging, but this was to be expected. In other lines there seems to be some spottiness. Where, for instance, one house will show a fair demand for finer grades of paper, perhaps another will show a disappointing demand for fine grades, but a good demand for something else. The entire volume is hardly what had been hoped for, what with NRA propaganda and a lot of other moves to stimulate trade.

Opening of the fall season has caused some increase in demand for newsprint, but the papers are not as heavy as they should be this time of the year. Whether this situation will become better as the holiday season approaches remains to be seen, but many believe it will. It is only a few weeks now until the opening of the holiday season and incidentally some demand is being seen this early for strictly holiday merchandise.

From the Indiana mills comes continued good news in the way of orders and production. Thus far the Indiana mills have had no difficulty with strikes or anything resembling labor disputes, and some of them are holding their breath. Nor, for that matter, do there appear to be any signs of intensive labor organization work being done in the state, though in a lot of other lines affected by the NRA and formerly unorganized, the labor organizers are thick and in some instances strikes have been called. Container manufacturers report a continued good business, with more and more former buyers getting into the field. There is a lot of competition in the container field, but the Indiana factories seem to be taking care of themselves.

Paper stock men continue to do a fair business. Prices are staple and most of the warehouses are in better shape than they have been for months. While mill buying is not so heavy, orders are sufficiently numerous to maintain more than usual activity.

Howard Team Wins Championship

URBANA, OHIO, September 30, 1933—The Softball Team sponsored by The Howard Paper Company at Urbana, Ohio, and managed by Louis Fondersmith, foreman of the finishing room at the Howard Mill, on Sunday, September 17, achieved the distinction of winning the Central Ohio championship.

Fifteen teams competed in the final tournament, which was played at Tritt Field, Urbana, Ohio, and some of the best teams in Central Ohio were in action.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

CIGARETTE PAPER

Champagne Paper Corp., Paris, Havre, 741 cs.; Standard Products Corp., Paris, Havre, 30 cs.

WALL PAPER

American Express Co., American Trader, London, 1 ble.; S. K. Lonegren, Drottningholm, Gothenburg, 2 cs.

NEWS PRINT

Jay Madden Corp., Gen. von Steuben, Bremen, 129 rolls; Jay Madden Corp., Pr. Harding, Hamburg, 136 rolls; Perkins Goodwin & Co., New York, Hamburg, 528 rolls.

PRINTING PAPER

Ozalid Corp., Statendam, Rotterdam, 1 cs.; F. C. Strype, New York, Hamburg, 46 cs.

WRAPPING PAPER

Heemsoth Basse & Co., Statendam, Rotterdam, 25 bls.; Van Oppen & Co., Pr. Monroe, Genoa, 10 cs.; Meadows Wye & Co., American Trader, London, 6 cs.

FILTER PAPER

H. Reeve Angel & Co. Inc., American Trader, London, 8 cs.

FILTER COMPOSITION

Atlantic F'd'g. Co., Columbus, Bremen, 100 bls.; ——, Pr. Harding, Havre, 20 bls.

TISSUE PAPER

W. J. Byrnes, Berengaria, Southampton, 2 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Minnewaska, Antwerp, 28 cs.; Globe Shipping Co., Gen. von Steuben, Bremen, 39 cs.; Globe Shipping Co., Columbus, Bremen, 20 cs.; Chas. Happel, Pr. Harding, Hamburg, 3 cs.

METAL COATED PAPER

Globe Shipping Co., Gen. von Steuben, Bremen, 57 cs.; K. Pauli Co., New York, Hamburg, 2 cs.; Globe Shipping Co., New York, Hamburg, 11 cs.; Rohner Gehrig & Co., New York, Hamburg, 33 cs.

BASIC PAPER

F. C. Strype, Gen. von Steuben, Bremen, 17 cs.; Globe Shipping Co., Columbus, Bremen, 26 cs.; S. Bienfang, Columbus, Bremen, 18 cs.

COATED PAPER

Phoenix Shipping Co., Pr. Harding, Hamburg, 1 cs.; Chas. Happel, New York, Hamburg, 31 cs.

PHOTO PAPER

J. J. Gavin, Olympic, Southampton, 4 cs.

TRANSFER PAPER

F. L. Kramer & Co., Europa, Bremen, 51 cs.; Rohner Gehrig & Co., Columbus, Bremen, 6 cs.

DECALCOMANIAS

Seller Transportation Co., Europa, Bremen, 17 cs.

COLORED PAPER

P. H. Petry & Co., Columbus, Bremen, 9 cs.; ——, Columbus, Bremen, 3 cs.

PARCHMENT PAPER

L. A. Consmiller, Gen. von Steuben, Bremen, 3 cs.

WRITING PAPER

A. W. Fenton, Inc., Liberty, Havre, 7 cs.; Meadows Wye & Co., American Trader, London, 5 cs.

ENVELOPES

Beckhard Simfred Co., Pr. Harding, Hamburg, 36 cs.

STENCIL PAPER

Frankel Carbon & Ribbon Manfg. Co., American Trader, London, 1 cs.

STRAW BOARD

Brodmill Co. Inc., Statendam, Rotterdam, 60 rolls.

PASTE BOARD

L. T. Piver, Inc., Paris, Havre, 3 cs.; ——, New York, Hamburg, 40 cs.

MISCELLANEOUS PAPER

Japan Paper Co., Pr. Taft, Kobe, 30 cs.; ——, Gen von Steuben, Bremen, 12 bls.; M. M. Cohen, Drottingholm, Gothenburg, 40 bls.; Blauvelt Wiley Paper Manfg. Co., Drottingholm, Gothenburg, 30 rolls; Kraemer & Co., Drottingholm, Gothenburg, 129 bls.; The Borregaard Co. Inc., Drottingholm, Gothenburg, 693 rolls; Houbigant, Inc., Paris, Havre, 2 cs.; Kraemer & Co., Paris, Havre, 3 cs.; E. B. Baehr & Son, De Grasse, Havre, 2 cs.; Davies Turner & Co., Pr. Harding, Havre, 9 cs.; W. Bersch, New York, Hamburg, 11 cs.; ——, New York, Hamburg, 84 rolls.

RAGS, BAGGINGS, ETC.

——, Statendam, Rotterdam, 26 bls. rags; J. F. Ryan Sons, Inc., Statendam, Rotterdam, 697 bls. cotton waste; J. F. Ryan Sons, Inc., Black Hawk, Antwerp, 2419 bls. cotton waste; G. A. Henshaw & Son, Black Hawk, Antwerp, 348 bls. flax waste; Royal Manfg. Co., Black Hawk, Antwerp, 38 bls. cotton waste; A. H. Searle, Black Hawk, Antwerp, 20 bls. rags; E. J. Keller Co. Inc., Black Hawk, ——, 152 bls. bagging; J. F. Ryan Sons, Inc., Minnewaska, Antwerp, 156 bls. cotton waste; ——, Gen. von Steuben, Bremen, 200 bls. cotton waste; G. W. Millar & Co. Inc., Liberty, Dunkirk, 31 bls. flax waste; T. D. Downing & Co., Caledonia, Glasgow, 77 bls. bagging; Chase National Bank, American Trader, London, 158 bls. rags; J. Cohen Sons Co. Inc., American Trader, London, 28 bls. rags; Irving Trust Co. Scanyork, Stettin, 81 bls. rags; ——, Scanyork, Stockholm, 13 bls. rags; Central Hanover Bank Trust Co., De Grasse, Havre, 125 bls. bagging; ——, Exmouth, Barcelona,271 bls. bagging; ——, Exmouth, Barcelona, 133 bls. old cottons; Van Oppen & Co., Pr. Harding, Hamburg, 84 bls. bagging, ——, New York, Hamburg, 46 bls. rags.

GLUE STOCK, ETC.

——, New York, Hamburg, 100 bags hide glue; ——, New York, Hamburg, 150 bags bone glue.

OLD ROPE

E. J. Keller Co. Inc., Statendam, ——, 69 coils; Banco Coml Italiane Trust Co., Gen. von Steuben, Bremen, 57 coils; A. S. Wilson, Inc., Liberty, Havre, 82 coils; ——, Caledonia, Glasgow, 104 coils; ——, American Trader, London, 61 coils; Brown Bros. Harriman & Co., De Grasse, Havre, 30 rolls; Banco Coml Italiane Trust Co., Columbus, Bremen, 49 coils; ——, New York, Hamburg, 13 coils.

CHINA CLAY

L. A. Salomon & Bro., Laconia, Liverpool, 270 bags; Whitaker Clark & Daniels, Laconia, Liverpool, 390 bags.

CASEIN

D. C. Andrews & Co., New York, Hamburg, 203 bags.

WOOD PULP

Bulkley Dunton & Co., Gen. von Steuben, ——, 500 bls. wood pulp; M. Sone, Gen. von Steuben, Bremen, 676 bls. wood pulp; ——, Gen. von Steuben, Bremen, 400 bls. wood pulp; Stora Kopparberg Corp., Luossa, Skutskar, 2000 bls. wood pulp; Perkins Goodwin & Co., Luossa, Wifstavarf, 900 bls. sulphite; Johaneson Wales & Sparre, Inc., Drottingholm, Gothenburg, 127 bls. sulphite; E. M. Sergeant & Co., Drottingholm, Gothenburg, 898 bls. kraft soda pulp; Stora Kopparberg Corp., Scanyork, Skutskar, 1100 bls. wood pulp; Atterbury Bros. Inc., Scanyork, Stockholm, 400 bls. sulphite, 50 tons; Chase National Bank, Scanyork, Stockholm, 400 bls. sulphite, 50 tons; ——, Pr. Harding, Hamburg, 698 bls. wood pulp, 107 tons; Castle & Overton, Inc., New York, Hamburg, 280 bls. wood pulp, 56 tons; Bulkley Dunton & Co., Minnequa, ——, 2850 bls. wood pulp.

WOOD PULP BOARDS

Lagerloef Trading Co., Pr. Harding, Hamburg, 112 bls., 21 rolls.

ALBANY IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

Amtorg Trading Corp., Titanium, Archangel, 3484 cords pulp wood; Johaneson Wales & Sparre, Inc., Luossa, Wifstavarf, 125 bls. sulphite; Perkins Goodwin & Co., Luossa, Wifstavarf, 1500 bls. sulphite; ——, Luossa, Gefle, 2000 bls. sulphite; Pagel Horton & Co. Inc., Luossa, Gefle, 1625 bls. sulphite; Pagel Horton & Co. Inc., Luossa, Gefle, 750 bls. sulphate; Pagel Horton & Co. Inc., Luossa, Sikea, 2400 bls. sulphite; Pagel Horton & Co. Inc., Luossa, Kopmanholmen, 947 bls. sulphite; Gottesman & Co. Inc., Belos, Iggesund, 2375 bls. sulphite, 475 tons; Gottesman & Co. Inc., Luossa, Kalix, 3500 bls. chemical pulp; Perkins Goodwin & Co., Belos, Norresundet, 3625 bls. sulphate, 727 tons; Price & Pierce, Ltd., Belos, Orviken, 5400 bls. chemical pulp, 900 tons; Guaranty Trust Co., Belos, Kopmanholmen, 3060 bls. chemical pulp, 500 tons; ——, Belos, Hernosand, 1500 bls. sulphite, 250 tons; ——, Belos, Hernosand, 5520 bls. sulphite, 920 tons; Central Hanover Bank Trust Co., Belos, Hernosand, 3000 bls. sulphite, 500 tons.

NEW LONDON IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

Perkins Goodwin & Co., Luossa, Wifstavarf, 3000 bls. sulphate; Pagel Horton & Co. Inc., Luossa, Gefle, 1750 bls. sulphite; Bulkley Dunton & Co., Kelkheim, ——, 7200 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

Atkinson Haserick & Co., Pr. Monroe, Genoa, 11 cs. wrapping paper; Stone & Downer & Co., Laconia, Liverpool, 5 cs. surface coated paper; F. S. Webster Inc., Laconia, Liverpool, 18 cs. tissue paper; G. F. Malcolm Inc., Laconia, Liverpool, 4 cs. tissue paper; ——, Laconia, Liverpool, 466 bags hide cuttings; Bulkley Dunton & Co., Kelkheim, ——, 300 bls. wood pulp; Bulkley Dunton & Co., Simon von Utrecht, ——, 4750 bls. wood pulp; Gottesman & Co. Inc., Westerwald, Finland, 600 bls. wood pulp.

PORTLAND IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

Gottesman & Co. Inc., Tugela, Sweden, 3875 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

J. Anderson & Co., Scanyork, Stettin, 390 bls. wood pulp, 77 tons; J. Lang Paper Co., Scanyork, Stettin, 334 bls. rags; Stora Kopparberg Corp., Scanyork, Skutskar, 3625 bls. wood pulp; Price & Pierce, Ltd., Scanyork, Wallvik, 300 bls. sulphite, 50 tons; Price & Pierce, Ltd., Scanyork, Wallvik, 125 bls. mechanical pulp, 25 tons; ——, Exmouth, Malta, 41 bls. rags; Gottesman & Co. Inc., Haarfagre, Sweden, 18000 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

Keene & Arkus, Black Hawk, Antwerp, 94 bls. rags; Congoleum Nairn Co., Black Hawk, Antwerp, 614 bls. rags; Congoleum Nairn Co., Black Hawk, Antwerp, 185 bls. bagging; Congoleum Nairn Co., Liberty, Dunkirk, 824 bls. rags; Keene & Arkus, Liberty, Dunkirk, 56 bls. rags; Congoleum Nairn Co., Liberty, Havre, 522 bls. rags; Pagel Horton & Co. Inc., Luossa, Domsjo, 3150 bls. wood pulp; Pagel Horton & Co. Inc., Luossa, Sikea, 2100 bls. wood pulp; ——, Luossa, Kalix, 2750 bls. wood pulp; Stora Kopparberg Corp., Luossa, Skutskar, 500 bls. wood pulp; Perkins Goodwin & Co., Luossa, Wifstavarf, 300 bls. wood pulp; Perkins Goodwin & Co., Luossa, Sweden, 1650 bls. wood pulp; Bulkley Dunton & Co., City of Norfolk, ——, 700 bls. wood pulp; Bulkley Dunton & Co., Simon von Utrecht, ——, 125 bls. wood pulp; Gottesman & Co. Inc., Titania, Norway, 1098 bls. wood pulp; Gottesman & Co. Inc., Tugela, Sweden, 1025 bls. wood pulp.

CAMDEN IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

Bulkley Dunton & Co., Kelkheim, ——, 9000 bls. wood pulp.

NEWPORT NEWS IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

Gottesman & Co. Inc., Tugela, Sweden, 1900 bls. wood pulp.

WILMINGTON IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

Price & Pierce, Ltd., Scanyork, Wallvik, 3000 bls. sulphite, 500 tons.

MOBILE IMPORTS

WEEK ENDING SEPTEMBER 30, 1933

Parsons & Whittemore, Inc., Topa Topa, ——, 204 bls. sulphite; Parsons & Whittemore, Inc., Wacosta, ——, 125 bls. sulphite.

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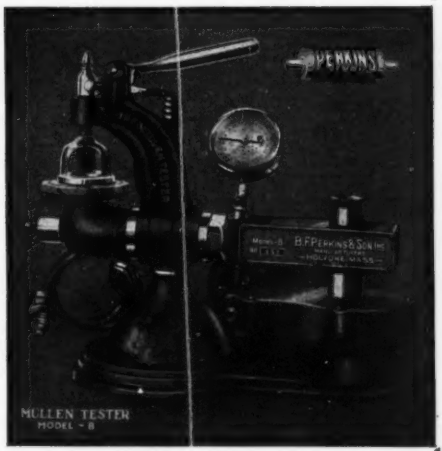

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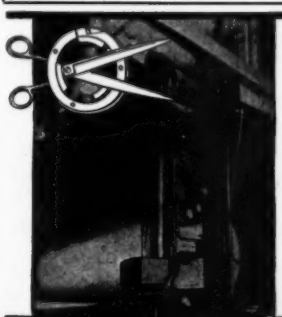

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LANGSTON SLITTERS

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, October 4, 1933.

Conditions in the local paper market are fairly satisfactory. While demand for the various standard grades of paper continues light, the outlook for more lively trading in the near future is promising. Sales forces of the leading paper organizations are optimistic. Prices are generally holding up well.

The news print paper market is displaying signs of improvement. Production in the United States, Canada and Newfoundland is substantially ahead of the corresponding period of last year, and shipments are going forward in good volume. The price situation remains unchanged.

Trading in the paper board market is fairly active. Box board manufacturing operations are proceeding at near capacity. Prices are steady. The fine paper market is rather dull at present. Kraft wrapping paper is moving freely. Prices are holding to previously quoted levels.

Mechanical Pulp

The ground wood pulp market is practically unchanged Production is being maintained in sufficient volume to take care of current requirements. The contract movement is well up to average for the time of year. Quotations on both imported and domestic mechanical pulp are steady.

Chemical Pulp

Steadiness prevails in the chemical pulp market, although demand for the various imported and domestic grades has fallen off slightly. Contract shipments are moving regularly. Imported easy bleaching sulphite is still quoted at from $2.10 to $2.20, on dock, Atlantic ports; while domestic and Canadian easy bleaching is selling at from $1.90 to $2.05, f.o.b. pulp mill.

Old Rope and Bagging

The old rope market is marking time. Paper mill demand for domestic and foreign old manila rope is light. Small mixed rope is dull. Old rope prices remain unchanged. The bagging market is only moderately active. Scrap and gunny bagging are quiet, and roofing bagging is irregular.

Rags

Some improvement was noticed in the domestic rag market. Demand for new cotton rags is fairly persistent. No. 1 white shirt cuttings continue to display strength. Roofing grades, however, are rather dull. The imported rag market is still affected by fluctuations of foreign currencies.

Waste Paper

The paper stock market is decidedly easier. Despite the fact that board mill demand for the lower grades has declined, however, leading dealers are confident that trading will become livelier in the near future. Quotations on No. 1 mixed paper are lower, and some of the higher grades are also softer.

Twine

Most of the business transacted in the local twine market during the past week was along routine lines. An expansion of trading is confidently expected during the closing weeks of the year, at least. Despite the usual keen competition for desirable orders prices are well sustained.

Directory of German Paper Mills

The twenty-fourth edition of the Directory of Paper, Pulp and Cellulose Mills of Germany and Neighboring Countries has just been issued. The contents includes a list of Paper, Pulp and Cellulose mills of Germany, including Anhalt, Baden; Bavaria, (Pfalz, Brunswick, Hamburg, Hesse, Lippe and Mecklenburg); Prussia, (Bradenburg, Hanover, Hesse-Nassau, Hohenzollern, East Prussia, Pommerania, Rhineland, Saxony, Silicia, Schleswig-Holstein, Westphalia and West Prussia); Saxon Free State, Thuringia, Wurttemberg, Danzig Free State and Memel. The Directory also includes a list of Paper, Pulp and Cellulose Mills in Belgium, Denmark, Alsace-Lorraine, Esthonia, Latvia, Lithuania, Luxemberg, Netherlands, Austria, Poland, Switzerland, Czechoslovakia, and Hungary.

There is printed also an article on the Quality and Quality Improvement of Paper, by M. von Wussow of the Association of German Paper Manufacturers, Berlin.

The Directory is indexed alphabetically according to towns and also is indexed alphabetically according to firms.

The Directory is published by Guntter-Staib Verlag, Biberach-Riss, (Wurttemberg), Germany.

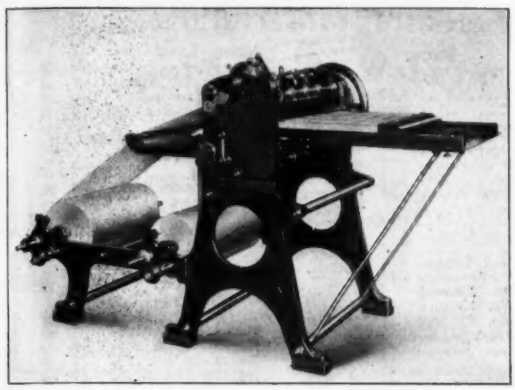
Indiana Firms to Be Favored

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., October 2, 1933—Governor Paul V. McNutt last week served notice on the paper jobbers and manufacturers of the state, and at the same time to others, that "state purchases will be awarded to the lowest bidder in all cases, but everything being equal, Indiana firms will be favored." This rule was laid down after a protest from an Indiana paper company because of the award of a contract to a St. Louis firm for toilet paper. The St. Louis firm had the low bid by 21 cents a case and the Indiana firm complained. According to the Governor this difference was too much to consider the offer of an Indiana firm against an outstate firm.

Now Clinton Co.

Because of being generally known to the trade as the Clinton Company and because the present name is not fully descriptive of the various products made by it as well as for reasons of brevity and convenience to the trade, the name of the Clinton Corn Syrup Refining Company, Clinton, Iowa, has been changed to the Clinton Company. The name of the company's subsidiary has been changed to the Clinton Sales Company, Inc.



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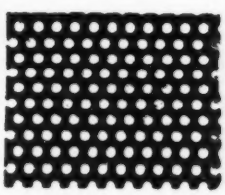

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FINEST PAPER CLAYS

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, October 4, 1933.

BLANC FIXE.—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The powder is quoted at from 3½ to 3¾ cents per pound, in barrels, at works; while the powder is selling at from $42.50 to $45.00 per ton, in bulk.

BLEACHING POWDER.—Steadiness prevails in the bleaching powder market. The contract movement is fairly heavy. Prices are holding to formerly quoted levels. Bleaching powder is quoted at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—The casein market is quiet. Domestic standard ground is still quoted at 14 cents and finely ground at 15 cents per pound. Argentine standard ground is selling at 14 cents and finely ground at 14½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Sentiment in the caustic soda market is optimistic. Prices are steady and unchanged. Solid caustic soda is quoted at from $2.55 to $3.00; while the flake and the ground are selling at from $2.95 to $3.00 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is fairly active. Contract shipments are moving along regularly. Imported china clay is quoted at from $12 to $17 per ton, ship side; while domestic paper making clay is selling at from $4.50 to $12 per ton, at mine.

CHLORINE.—Demand for chlorine is quite persistent. The contract movement is well up to average. Prices are holding to previously quoted levels. Chlorine is selling at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is softer. The grades of gum rosin used in the paper mills are now quoted at from $5.05 to $5.15 per 280 pounds, in barrels, at works; while wood rosin is selling at $4.00 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Firmness prevails in the salt cake market. Prices remain unaltered. Salt cake is quoted at from $14 to $14.50; chrome salt cake at from $13.50 to $14 per ton, at works; while foreign salt cake is selling at from $14 to $14.50 per ton, on dock.

SODA ASH.—The soda ash market is displaying a strong undertone. Contract shipments are going forward in good volume. Prices are firm. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.30; and in barrels, $1.43.

STARCH.—Conditions in the starch market are fairly satisfactory. The contract movement is seasonal. Prices are slightly easier. Special paper making starch is now quoted at $2.82 per 100 pounds, in bags; and at $3.09 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Paper mill demand for sulphate of alumina is excellent. Prices are holding to schedule. Commercial grades are quoted at from $1.25 to $1.46; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues firm. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market during the past week was along routine lines. Domestic talc is still quoted at from $16 to $18 per ton, in bulk, at eastern mines; while imported talc is selling at from $20 to $50 per ton, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	—
Bonds	6.00	@	—
Index	6.00	@	—
Writings—			
Extra Superfine	6.50	@	—
Superfine	6.25	@	—
Tub sized	5.75	@	—
Engine sized	5.50	@	—
Book, Cases—			
S. & S. C.	5.50	@	—
S. & S. C. Litho.	5.75	@	—
M. F.	5.25	@	—
Coated and Enamel	6.15	@	9.30
Coated Litho	6.90	@	—
Tissues—Per Ream—			
White No. 1	.60	@	.80
White No. 2	.55	@	.70
Anti-Tarnish M. G. only	.75	@	.80
Colored	.80	@	1.00
Kraft	.75	@	.80
Manila	.65	@	.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middles	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.11	@	—
No. 2	.10	@	—
Bleached, basis 20 lbs.	.13	@	—

(Delivered New York)

News, per ton—			
Roll, contract	40.00	@	—
Rolls, spot	40.00	@	—
Sheets	45.00	@	—
Side Runs	25.00	@	—
Kraft—			
No. 1 Domestic	4.75	@	5.00
No. 2 Domestic	3.62½	@	4.00
Southern	3.62½	@	4.00
Imported	Nominal		
Boards—per ton—			
News	45.00	@	50.00
Chip	42.50	@	47.50
Binders Boards	68.00	@	72.00
Kraft Liner	75.00	@	85.00
Standard 85 Test			
Jute Liner	50.00	@	55.00
Sgl. Mla. Ll. Chip	52.50	@	55.00

(F. o. b. Mill)

Wood Pulp Board	70.00	@	80.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	27.50	@	29.00
Dry	28.00	@	29.50

(F.o.b. Mill)

No. 1 Domestic and Canadian	24.00	@	28.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	2.70	@	3.00
Easy Bleaching	2.10	@	2.20
No. 1 strong unbleached	1.90	@	2.00
Mitscherlich Unbleached	1.95	@	2.05
No. 2 Strong unbleached	1.75	@	1.85
No. 1 Kraft	1.75	@	1.85
No. 2 Kraft	1.60	@	1.70
Sulphate—			
Bleached	2.75	@	3.25

(F. o. b. Pulp Mill)

Sulphite (Domestic and Canadian)—			
Bleached	2.50	@	3.75
Easy Bleaching	1.90	@	2.05
News	1.85	@	1.95
Mitscherlich unbleached	2.25	@	2.50
Kraft (Domestic)	1.60	@	2.75
Soda Bleached	2.50	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.00
Silesias No. 1	4.25	@	4.50
New Unbleached	6.75	@	7.25
New Soft Blacks	3.00	@	3.25
Blue Overall	4.25	@	4.50
Fancy	2.50	@	2.75
Washables	2.00	@	2.25
Mixed Khaki Cuttings	3.25	@	3.50
O. D. Khaki Cuttings	4.00	@	4.25
Men's Corduroy	1.50	@	1.75
New Mixed Blacks	2.50	@	2.75

Old Rags

White, No. 1—			
Repacked	3.75	@	4.00
Miscellaneous	3.00	@	3.50
White, No. 2—			
Repacked	2.00	@	2.50
Miscellaneous	1.75	@	2.00
Thirds and Blues—			
Repacked	1.75	@	2.00
Miscellaneous	1.50	@	1.75
Black Stockings	2.50	@	3.00
Roofing Rags—			
No. 1	.90	@	.95
No. 2	.80	@	.85
No. 3	.75	@	.80
No. 4	.70	@	.75
No. 5A	.65	@	.70

Foreign Rags

New Rags

New Dark Cuttings	1.50	@	1.60
New Mixed Cuttings	1.60	@	1.70
New Light Silesias	3.50	@	3.75
Light Flannelettes	3.25	@	3.50
Unbleached Cuttings	5.75	@	6.00
New White Cuttings	5.50	@	6.00
New Light Oxfords	3.25	@	3.50
New Light Prints	2.75	@	3.00

Old Rags

No. 1 White Linens	7.00	@	7.50
No. 2 White Linens	6.00	@	6.50
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	3.75	@	4.00
No. 2 White Cotton	3.00	@	3.25
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.50	@	1.60
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	1.65	@	1.80
French Blue Linens	2.10	@	2.25
German Blue Linens	1.85	@	2.00
German Blue Cottons	1.35	@	1.50
Checks and Blues	1.30	@	1.40
Lindsay Garments	1.10	@	1.15
Dark Cottons	1.00	@	1.10
Old Shopperies	.85	@	.90
New Shopperies	.80	@	.85
French Blues	1.50	@	1.65

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.30	@	1.40
Domestic	1.25	@	1.35
Wool Tares, light	1.05	@	1.15
Wool Tares, heavy	1.05	@	1.15
Bright Bagging	1.00	@	1.10
Manila Rope—			
Foreign	2.50	@	2.75
Domestic	2.50	@	2.75
Small Mixed Rope	1.10	@	1.35
New Burlap Cut	1.50	@	1.75
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.60	@	2.75
Ordinary Hard White No. 1	2.30	@	2.50
Hard White No. 2	2.20	@	2.30
Soft White No. 1	2.15	@	2.25
Flat Stock-			
Stitchless	1.10	@	1.15
Overissue Mag	1.10	@	1.15
Solid Flat Book	1.00	@	1.05
Crumpled No 1	.85	@	.90
Solid Book Ledger	1.50	@	1.75
Ledger Stock	1.05	@	1.15
New B. B. Chips	.50	@	.60
Manilas—			
New Env. Cut	1.65	@	1.75
New Cuttings	1.20	@	1.25
Extra No. 1 old	.90	@	1.00
Print	Nominal		
Bogus Wrapper	.70	@	.80
Container	Nominal		
Old Kraft Machine—			
Compressed bales	1.15	@	1.25
News—			
No. 1 White News	1.20	@	1.30
Strictly Overissue	.75	@	.85
Strictly Folded	.70	@	.75
No. 1 Mixed Paper	.45	@	.50

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Twines

(F. o. b. Mill)

Cotton—			
B. C. 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.15½	@	.16½
No. 2	.15	@	.16
Tube Rope—			
4-ply and larger	.09¾	@	.11¾
Fine Tube Rope—			
4-ply	.13¼	@	.14¾
3-ply	.14¼	@	.14¾
2-ply	.15¼	@	.15¾
Paper Makers Twine	.08¾	@	.10¾
Box Twine, 2-3 ply	.12¾	@	.13½
White Hemp	.12¾	@	.15¾
Java Sisal—			
No. 1 Basis	.11½	@	—
No. 2 Basis	.10½	@	—
New Zealand Sisal	.11½	@	—
Sisal Lath Yarn—			
No. 1	.13½	@	.15½
No. 2	.11½	@	.13½
Manila Twine	.24½	@	.29½

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.30	@	.53¾
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.04	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.07	@	.12
No. 1 M F Book	.06½	@	.07¾
No. 2 M. F. Book	.05¾	@	.06¾
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¾
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	3.50	@	4.50
Southern Kraft	2.62½	@	—
No. 2 Kraft	2.62½	@	—
Wood Tag Boards	.04¼	@	.06¾
Sulphite Screenings	.03	@	.03¾
Manila Tissue	.07	@	.07¾
White Tissue	.07¾	@	.07½

(Delivered Central Territory)

News, per ton—			
Rolls, contract	45.00	@	—
Sheets	50.00	@	—
Boards, per ton—			
Plain Chip	37.50	@	—
Solid News	43.50	@	—
Manila Lined Chip	47.50	@	—
Patent coated	55.00	@	—
Container Lined—			
85 Test	60.00	@	65.00
100 Test	60.00	@	70.00

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.70	@	1.80
No. 1 Hard White	1.40	@	1.50
No. 1 Soft White	1.20	@	1.30
Ledger & Writings	.80	@	.90
Solid Books	.80	@	.90
Blanks	1.00	@	1.05
Kraffts	.90	@	1.00
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	1.00	@	1.05
Print Manila	.60	@	.65
Overissue News	.60	@	.70
Old Newspapers—			
No. 1	.55	@	.65
Mixed Papers—			
No. 1	.50	@	.55
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.26
Fine	.15	@	.20
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.10
Manila Sul., No. 1	.03	@	.06
Manila No. 2	.03	@	.05
No. 1 Kraft	.05¼	@	.06½
No. 2 Kraft	.03¾	@	.05
Southern Kraft	2.75	@	4.00
Common Bogus	.03	@	.04½

(Delivered Philadelphia)

News Print Rolls	46.00	@	55.00
Straw Board	40.00	@	45.00
News Board	37.00	@	45.00
Chip Board	40.00	@	45.00
Wood Pulp Board	70.00	@	85.00

(Delivered Boards)

No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.23

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.03½	@	.04
New White, No. 2.	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft.	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01½	@	.02
Blue Overall	.03½	@	.04
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.01½	@	.03
Fancy	.01½	@	.03
New Black Soft	.02	@	.04
New Light Seconds	.01½	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.04
No. 2 Mixed	.03	@	.04
Corduroy	.02	@	.03
New Canvas	.03½	@	.04½
New Black Mixed	.02½	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.50
Miscellaneous	1.75	@	2.25
M. G.	3.00	@	3.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.50
Repacked	1.50	@	2.00
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.85

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	1.75
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.30	@	2.40
No. 2 Hard White	2.10	@	2.15
No. 1 Soft White	2.15	@	2.20
No. 2 Soft White	1.15	@	1.25
No. 1 Mixed	.95	@	1.00
No. 2 Mixed	.75	@	.80
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.15	@	1.20
No. 1 Books, heavy	1.20	@	1.25
No. 2 Books, light	.90	@	1.00
No. 1 New Manila	1.65	@	1.75
No. 1 Old Manila	.95	@	1.00
Print Manila	.90	@	.95
Container Manila	.85	@	.90
Old Kraft	1.20	@	1.25
Common Paper	.40	@	.45
No. 1 Mixed Paper	.50	@	.60
Straw Board Chip	.50	@	.60
Binders Board Chip	.50	@	.60
Corrugated Board	.75	@	.80
Overissue News	.65	@	.70
Old Newspapers	.60	@	.65

BOSTON

Paper

(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05½	@	.11
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04⅞	@	—
No. 2 Kraft	.03½	@	—

(F. o. b. Boston)

Southern Kraft	.03½	@	—

(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)

Common Bogus	.02	@	.02¼

(Delivered New England points)

News Print, rolls	44.50	@	—
Straw Board, rolls.009	—	@	35.00
Straw Board in Sheets, basis 35s to 70s	—	@	40.00
Filled News Board	45.00	@	50.00
Chip Board	42.50	@	47.00
Chip Board (Creasing)	45.00	@	—
Single Manila Lined Chip	52.50	@	62.50
Single White, Patent Coated News Board—			
Bender	62.50	@	72.50
Wood Pulp Board	70.00	@	75.00
Binder Boards	62.00	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	—	@	2.50
No. 1 Soft White	—	@	2.25
No. 1 Mixed	.90	@	1.00
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.40	@	1.50
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	1.00	@	1.10
No. 1 Books, heavy	1.10	@	1.20
No. 1 Books, light	.80	@	1.00
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.95	@	1.05
White Blank News	1.20	@	1.30
No. 1 Kraft	1.10	@	1.15
Manila	.90	@	1.05
No. 1 Mixed Papers	.40	@	.42½
Print Manila	.75	@	.80
Overissue News	.80	@	.90
Old Newspapers	.62½	@	.65
Box Board Chips	.45	@	.50
Corrugated Boxes	.55	@	.60
Screening wrappers	.75	@	.85

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	—	@	2.25
Domestic	2.50	@	—
Transmission Rope	1.50	@	—
Mixed Strings	.65	@	.75
Jute Rope	1.00	@	1.15
Jute Carpet Threads	.65	@	.70
Gunny No. 1—			
Foreign	1.25	@	1.30
Domestic	1.20	@	1.25
Bleachery Burlap	3.00	@	3.25
Scrap Burlap	1.00	@	1.10
No. 1 Scrap Burlap	1.20	@	1.25
Scrap Sisal	1.10	@	1.15
Scrap Sisal for shredding	1.15	@	1.30
Wool Tares, heavy	1.15	@	1.25
New Burlap Cuttings	1.15	@	1.25
Australian Wool Pouches	2.50	@	—
Heavy Baling Bagging	1.60	@	1.85
Paper Mill Bagging	.85	@	.95
Bagging No. 2	.50	@	.60
No. 1 Burlap	1.75	@	2.25

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.02	@	.02¼
New White No. 1	.05½	@	.06
New White No. 2	.04½	@	.05
Silesias No. 1	.04	@	—
New Black Silesias	.02½	@	.03
New Unbleached	—	@	.05½
Blue Cheviot	—	@	4.65
Fancy	—	@	.32½
Washable	.02¼	@	—
Cottons—According to grades—			
Blue Overalls	—	@	.03¼
New Black, soft	.04	@	.04½
Khaki Cuttings	.03	@	.03¼
O. D. Khaki	.03	@	.03¼
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	.05	@	.05½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	—
White No. 2—			
Repacked	.01½	@	.01¾
Miscellaneous	.01½	@	.01¾
Twos and Blues	1.25	@	1.50
Thirds and Blues			
Repacked	1.10	@	1.25
Miscellaneous	.85	@	.90
Black Stockings	2.25	@	2.50
Roofing Stock—			
No. 1	.70	@	.75
No. 2	.55	@	.65
No. 3	.35	@	.45

Foreign Rags

(F. o. b. Boston)

Dark Cottons	.95	@	—
New White Shirt Cuttings	5.50	@	6.50
Dutch Blues	2.00	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.55	@	1.60
Old Linsey Garments	1.35	@	—

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.09¾	@	—
No. 2 Sulphite	.08	@	—
No. 1 Colored	.10¼	@	—
No. 2 Colored	.08½	@	.10½
Ledgers (sulphite)			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.20	@	—
No. 3 M. F. (Carloads)	5.70	@	—
No. 4 M. F. (carloads)	4.75	@	—
No. 1 S. C. (carloads)	6.65	@	—
No. 3 S. C. (carloads)	6.20	@	—
No. 4 S. C. (carloads)	5.20	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.25	@	—
White Wrap	2.00	@	—
"B" Manila	4.75	@	—
No. 1 Manila	5.25	@	—
Fiber	5.25	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.25	@	—

(F.O.B. Cars Toronto)

News, per ton—			
Rolls (contract)	45.50	@	—
Sheets	50.50	@	—

Pulp

(F. o. b. Mill)

Ground Wood	18.00	@	20.00
Sulphite easy bleach ing	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	50.00	@	55.00
Sulphate	50.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.10
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.50
Book and Ledger			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock. Ledgers and Writings	.80	@	.90
	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.50
Printed Manilas	.55	@	.80
Kraft	1.25	@	1.50
News and Scrap			
Strictly Overissue	1.00	@	—
Strictly Folded	.85	@	—
No. 1 Mixed Paper	.70	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.05¼	@	.05½
Fancy Shirt Cuttings	.02¼	@	.02½